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NOVEMBER 15, 1916.

WHOLE SERIES, VOL. XL. No. 11. THIRD SERIES, VOL. XXXII.

The THERAPEUTIC GAZETTE

INCORPORATING

MEDICINE AND THE MEDICAL AGE

A Monthly Journal of Practical Therapeutics

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EDITORIAL OFFICE, N. W. Cor. 18th and Spruce Streets, PHILADELPHIA, PA.

SUBSCRIPTION RATES:

United States and Mexico, one year,	Two Dollars.
Canada, one year,	Two Dollars and Fifty Cents.
Foreign Countries (postage prepaid), one year,	Ten Shillings.

E. G. SWIFT, Publisher, DETROIT, MICHIGAN, U. S. A.

FOREIGN OFFICES:

LONDON, ENGLAND—19 & 20 Great Pulteney St., W. SYDNEY, N. S. W., AUSTRALIA—125 York St.

WALKERVILLE, ONT., CANADA. MONTREAL, QUE., CANADA—118 St. Paul St., W.

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Whole Series, Vol. XL. | DETROIT, MICH., NOVEMBER 15, 1916. | Third Series, Vol. XXXII, No. 11.

ORIGINAL COMMUNICATIONS.

INFILTRATION ANESTHESIA.

BY CHARLES F. NASSAU, M.D., LL.D., F.A.C.S.,

Assistant Professor of Surgery in the Jefferson Medical College, Philadelphia.

While general anesthesia will never be displaced, yet if an operation can be done without the discomfort and danger of general narcosis, why not, as frequently as possible, use some form of local anesthesia? This is a practical question.

There are many patients to whom it is unwise to administer general anesthesia. There is another class of patient where the question as to whether general or local anesthesia shall be used often means the question of life or death. For instance, when confronted by a patient desperately ill with a strangulated hernia, the patient will have many more chances for recovery if the surgeon is thoroughly familiar with some form of local anesthesia, whether it be nerve blocking, infiltration, or a combination of both, than he would have in the hands of a man who, through lack of knowledge, was compelled to use general anesthesia. It should be the practice of every surgeon to operate as often as he can under local anesthesia, even upon those cases that could perfectly well take a general anesthetic. This is the only way that the method can be learned so that it may be used successfully on demand.

The field of operative possibility under local anesthesia has broadened to such an extent that it is difficult to definitely limit its scope in the hands of one skilled in its use. The surgeon operating by this method must school himself to the use of an essentially different technique from that commonly employed in operations under a general anesthetic. He must be possessed of a calm temperament, skilled in clean operative dissections, and accustomed not to handle tissues unnecessarily. Above all things, he must have learned gentleness, willingness to spend plenty of time, and to have acquainted himself accurately with the sensibilities of the various tissues encountered in the different operative fields.

For the occasional operator to attempt major operations under local anesthesia is to court failure.

Infiltration anesthesia is a term used to indicate that form of local anesthesia which is secured by distending the tissues of a part of the body with a fluid, anesthetic in character, such as cocaine, or indifferent in nature, such as an isotonic solution of sodium chloride. We may use the phrase "terminal anesthesia" because the anesthetizing agent acts upon terminal branches of sensory nerves; "regional anesthesia" because the fluid injected affects some particular point of a sensory nerve in its course from the organ; still, the actual process is one of infiltration. If we inject the anesthetic around the nerve, the term "perineural injection" may be employed; when the fluid used to produce analgesia is introduced directly into the nerve, we speak of "endoneural injection;" nevertheless, the procedure is one of infiltration.

In making up a solution for injection, always use the smallest percentage of chemical agent necessary to render the part anesthetic. I have used various formulas during the past twenty years. At the present time, I find that either the solution recommended by Mitchell, or one-quarter-of-one-per-cent solution of novocaine in salt

solution, gives entire satisfaction. Mitchell uses a tablet containing three-fourths grain cocaine and one-four-hundredth grain adrenalin. These have been made for many years by one of our large drug houses. Two tablets should be taken from the hypodermic tube, wrapped in cotton, and put in a small vial closed with a cotton stopper. The tablets are then sterilized by dry heat in a temperature slowly rising to just short of 100° C. I make my solutions at the time of operation by dropping one tablet into 50 Cc. of salt solution, and the second tablet into a cup containing 100 Cc. of salt solution. The stronger solution is used for infiltrating the skin, blocking nerves, or for any particularly sensitive areas. The weaker solution is used for general infiltration of tissue. The one-quarter-of-one-per-cent novocaine solution should be boiled in small cotton-stoppered glass flasks, and the one strength may be employed throughout any operation. I have never seen the slightest deleterious physiological action with these extremely weak solutions of cocaine. The total dosage, however, should not exceed one and one-half grains.

The surgeon should provide himself with three Record syringes—two of 5-Cc. capacity each and one of 10-Cc. capacity, the latter as a rule being used only in fat subjects or in large operative fields, such as in shoulder-joint amputation, or amputation of a leg, or in breast work. Two fairly fine needles one and one-half inches long, two slightly coarser needles two inches long, and two about four inches long, will be necessary. A knife with an extremely keen edge, a pair of very sharp Mayo 5½-inch straight dissecting scissors, tooth-dissecting forceps, and fine-pointed artery clamps, will facilitate this kind of work.

As a concrete example, let us take an appendectomy in a patient with a frank tuberculosis of the lung, for whom general anesthesia would be extremely injurious:

The patient should always be informed that the success of the procedure will depend to a great extent upon his intelligent coöperation. In the majority of cases I administer one-quarter grain morphine hypodermically one-half hour before operation. With this may be given a dose of scopolamine varying from 1/100 to 1/50 grain, according to the age and size of the patient; usually, however, I do not give it. It should be the duty of some intelligent person to stay by the patient's head and distract his attention by trifling conversation, sponging his face, administering small sips of water if thirst is annoying—in other words, to distract the attention of the patient from the operation. One might call such a person the psychic anesthetist. Preoperative preparations and instruments should be carefully excluded from the range of the patient's vision. Needless conversation between surgeon, assistants, and nurses should be avoided.

The patient, having been prepared for operation, is placed upon the operating table and made as comfortable as possible. The head is arranged upon a pillow, the arms disposed comfortably at the sides, and a folded blanket is placed under the lumbar spine. The patient's wishes may be consulted as to whether he desires a piece of gauze placed over his eyes. Usually the patient, unless addressed, keeps his eyes closed. The psychic anesthetist engages the patient in conversation, the surgeon is cheerful, full of confidence, and endeavors to communicate his frame of mind to his subject.

Begin infiltration by taking a 5-Cc. syringe filled with the stronger cocaine and adrenalin solution; use a fine needle. Pinch up a small piece of skin, informing the patient that you are going to stick him with a needle. Holding the needle almost parallel with the skin, barely insert the point under the epidermis and at the same time press on the piston of the syringe so as to obtain an infiltrated spot simultaneously with the introduction of the needle. The pain caused by the introduction of the first needle is trivial and does not accompany subsequent insertions. A small wheal is now produced in which the integument assumes a blanched pig-skin appearance. From the center of this infiltrated circle the needle can now be painlessly inserted to its

full length in the skin (not under the skin) parallel with the surface. Do not insert the needle too deeply at this time. As the point of the needle travels, the solution should be fed from the syringe. Ordinarily, 2 Cc. of solution will infiltrate 1½ to 2 inches of skin. After the superficial infiltration, a coarser and longer needle should be used to infiltrate subcutaneous tissues.

The easiest method of approach to the appendix under infiltration anesthesia is McBurney's muscle-splitting incision. The incision can now be made down to the aponeurosis of the external oblique. Then infiltrate the muscular and aponeurotic portion of the external oblique. Make a split in the aponeurosis with knife and finish with Mayo scissors; gentle clips with the scissors cause less pain than knife dissection. Retract the aponeurotic layer carefully. Now infiltrate the internal oblique and split it. The transversalis and peritoneum are infiltrated with the stronger solution, which I employ at this point for the first time since the infiltration of the skin. Incisions in all layers of the abdominal wall must be of ample size to avoid unduly strong retraction. Up to this stage the patient should experience no pain unless a vein has been clamped without previous infiltration with the stronger solution. The visceral peritoneum may be cut, clamped, burned, and stitched with impunity, but undue traction upon the mesentery immediately causes general cramp-like abdominal pain with consequent rigidity of the abdominal wall. The appendix is sought for by gently following the anterior longitudinal band intra-abdominally, rather than by attempting to pull the cecum out of the abdominal incision. If the appendix is very adherent or carried up under the cecum, it may be necessary, in unusual cases, to give the patient a few inhalations of nitrous oxide during the freeing of the appendix. The gas anesthesia need not be continued after the base of the appendix is reached for crushing and tying. Traction on the mesoappendix must be gentle, and before tying it infiltrate with the stronger solution. The crushing, ligation, and inversion of the appendix is not accompanied by pain. Occasionally the necessary traction on the mesocolon will cause the patient to have nausea, which is relieved as soon as the traction ceases. Suture of the abdominal wall now follows without special incident, except that very small gutta-percha drains should be inserted just under the skin at one or both ends of the incision, when infiltration anesthesia has been used. These drains take care of any possible oozing that may occur after the effect of the adrenalin has worn off.

Wounds in patients operated upon under infiltration anesthesia heal just as kindly as any other wounds. The postoperative course is infinitely more comfortable. Unless much traction has been made on the abdominal viscera, vomiting rarely occurs. Postoperative thirst may be avoided by giving reasonable quantities of water at once. The severe backache complained of by patients who have taken a general anesthetic is absent. Peristalsis is rapidly established, and with a minimum of gas pains. The wound itself is never as painful; particularly, abdominal wounds are not insulted by coughing and vomiting. I have found, however, that in young children and neurotic individuals infiltration anesthesia is frequently an impossibility.

I have done all of the following operations under local anesthesia: Tracheotomy, tuberculous glands of neck, rib-resection, goitre, ligation of superior thyroid arteries, gastrostomy, iliac colostomy, typhoid perforation, abscess of lung, chronic and acute appendicitis, appendiceal abscess, jejunostomy; radical cure of inguinal, femoral, umbilical, strangulated, and incisional hernias; resection of the bowel, suprapubic cystotomy, ligation of femoral artery, cholecystostomy, suture of fractured patella, amputation of arm, amputation of thigh, amputation of leg, removal of stone from pelvis of kidney, posterior and anterior gastroenterostomies, hysteropexy, kidney abscess, psoas abscess, and have used it in large numbers of minor procedures.

1831 Chestnut Street.

BROMIDE SEDATION IN EPILEPSY.

BY WILLIAM T. SHANAHAN,
Superintendent Craig Colony for Epileptics, Sonyea, New York.

In a review of the literature in regard to the treatment of epilepsy, it is apparent that sedatives of various kinds were in use antedating the prescribing of bromide of potassium some sixty-five years ago. For a considerable time after the use of bromides was initiated the exact method of its operation in controlling seizures was not well understood. Subsequently experiments, carefully made, demonstrated that a sedative action on the cortical cells was effected by bromides given in sufficient dosage to insure physiological action. While perhaps a bromide repeated in reasonable doses, given under careful restrictions, may in the ordinary person cause no deleterious result, it has been too commonly the experience of physicians that bromides administered over a considerable period of time have in some patients caused permanent damage, or so reduced the general health of the individual under treatment that one might well feel convinced that the remedy was worse than the disorder.

It is a matter of record, however, that bromine, or some of its salts, when properly given, with due attention to combating the evil effects of the drug, bring about material improvement in carefully selected epileptics, and in some an apparent arrest of the symptoms of the disorder. The statement "carefully selected epileptics" is one which should be borne in mind, as it is not only useless but harmful to administer bromides indiscriminately to an epileptic patient solely because he or she presents many, or apparently all, of the phenomena belonging to the disorder, and in consequence the physician prescribes a sedative which should be used with careful discrimination.

Another phase of the use of bromides is that the epileptic outside of the special institution is oftentimes not under the close surveillance as to mode of living as is the institutional epileptic. Such lack of the following out of carefully regulated hygienic and dietetic rules of life requires in lieu thereof perhaps a more extended use of sedatives, *e.g.*, bromides in some form or other, where such sedation would not be required in the institutional epileptic. It is very commonly observed that the removal or alleviation of abnormal conditions existing in epileptics may so improve the general health of the particular patient that the symptoms of his epilepsy are relieved at least in part without the administration of depressants to the cortical substance. Unless the bromide is given in the form of sabromin, sedobrol, or some other of the more elegant preparations, great care must be exercised to give the bromide salt in solution following meals and well diluted. While the ordinary epileptic is prone to suffer from constipation, the one under bromide medication has a special tendency toward this symptom, therefore laxatives, colonic flushings, etc., must be freely resorted to. In order to maintain a proper functioning of the skin in the epileptic under bromide medication more frequent bathing than is ordinarily the case is essential. Proper care of the mouth, teeth, etc., is also of the utmost importance.

As the result of experience in various parts of the world in the treatment of epilepsy in its great variety of phases, it has been found that for selected patients without marked mental defectiveness or deterioration, suitable change of environment, the directing of the energies of the particular epileptic along new channels, prevending too much self-centering of interests, readjustment of any disturbing factors which might tend to cause undue psychic upset or unrest, the proper fitting of glasses, correction of dental caries when present, placing the individual at a congenial occupation with sufficient recreation during hours of leisure, allowing a reasonably restricted diet, and a common-sense following out of the rules of hygiene, have so harmonized the life processes that there occurs marked improvement in many epileptics in whom no sedation of any sort has been

resorted to. Sedatives such as bromides too often only mask the symptoms in epilepsy, tending to arouse false hopes as to complete recovery, thus often leaving out of action the basic readjustment of living conditions necessary to demand of an epileptic whose active coöperation in carrying out lines of treatment is absolutely essential for improvement.

At the Craig Colony for Epileptics during several years past there has been a marked reduction in the quantity of bromides used in the treatment of its patients, as is shown in the accompanying table. Among the bromine preparations used were the various bromide salts, potassium, sodium, and ammonium; bromopin; brometone; sabromin; sedobrol, etc. The patients under treatment were epileptics of all ages from infancy to the advanced senile period, the majority being young adults. The duration of epilepsy in those under treatment varied from a few months to a great number of years, the majority being several years. Both sexes were under treatment, a slightly greater number of males than females. It will be observed that while the average dosage of bromide used was materially lessened, the average number of seizures did not increase, as might be expected. A very considerable percentage of the patients had a well-defined organic epilepsy, the others what we still term in our lack of knowledge as "idiopathic." Chloral hydrate, amylene hydrate, hyoscine hydrobromide, and other sedatives have been made use of at the Colony, but for only acute phenomena—*e.g.*, status epilepticus, or serial seizures—and not administered regularly over a considerable period as is done with bromides. It is of interest to note that with the lessened administration of various preparations of bromine there has been no increase in the average number of seizures per patient, but on the other hand there has on the whole, if anything, been a slight lessening in the number, the conclusion being that the general readjustment of every possible phase of the epileptic's life is of more importance than the indiscriminate use of sedation.

Population of Colony by years.	Dosage. Ounces bromides and other bromide-containing compounds per patient yearly.	Average number of seizures per patient.
1902—762	10.8 ounces.	98
1903—824	12.5 "	124
1904—836	15.6 "	124
1905—992	10.8 "	146
1906—1046	12.2 "	136
1907—1054	5.7 "	128
1908—1160	8.8 "	127
1909—1273	3. "	113
1910—1330	.28 ounce.	110
1911—1381	1.7 ounces.	106
1912—1433	.1 ounce.	115
1913—1434	.4 "	104
1914—1428	.87 "	105
1915—1450	.45 "	95

OBSERVATIONS ON THE MEDICAL ASPECT OF CHOLECYSTITIS AND CHOLANGITIS.[1]

BY R. ALEXANDER BATE, M.D., LOUISVILLE, KENTUCKY.

The medical aspect of cholecystitis and cholangitis has, to me, always seemed clear. However, the spirit of the times has favored mechanical or empirical rather than rational or scientific therapeutics. A more adequate conception of the clinical situation may be obtained by temporarily forgetting the term "gall-stones;" instead let us consider the physicochemical processes resulting in the precipitation of biliary concretions.

It is well known that the interior structures of the larger bile channels, the gall-bladder, and the duodenum are identical; that these avenues are lined with continuous mucosa composed of columnar epithelial cells containing mucous glands; that the material secreted and excreted by these glands is also practically identical in composition. In the duodenum this is secretin or entero-kinase, which activates intestinal secretions. While the physiological action of the mucin contained in the biliary secretion has never been defi-

[1]Delivered before the Louisville Medical Club, Louisville, Kentucky, March 17, 1916.

nitely demonstrated, it seems reasonable to presume it has a controlling or regulating effect upon the functions of the biliary structures similar to that of "secretin" upon the intestinal tract. Mucin has been called albuminous material, or nucleo-albumin, by various writers.

Normal bile is composed of pigments, principally bilirubin and biliverdin, the so-called bile salts and fats, cholesterin, lecithin, and a minute quantity of calcium. Precipitation of cholesterin results from qualitative changes in the bile, due to irregular metamorphosis by disturbed metabolism and bacteria. Biliary concretions are never formed so long as the bile remains normal; it is only when the composition of the bile varies from the normal standard that the formation of such concretions occurs.

Cholesterin, which is the chief constituent of all biliary concretions, normally exists in the bile ducts in the amount of about one-sixteenth of one per cent; whereas in the gall-bladder one per cent may be present in normal bile. In pregnant women four times as much cholesterin is present as in the non-pregnant and in males. Thus there is a tremendously increased liability to the formation of biliary concretions in the pregnant, and this proportion holds good clinically; more than four multiparous women having gall-stones to one who is barren.

On account of its various constituents the bile possesses a distinct antiseptic quality. The minute quantity of calcium present may be of vital importance to biliary function—*i.e.*, it may be the controlling element by which secretion is established and maintained, and it may also be the chief factor in the formation of concretions. However, there are probably several causes for the increased cholesterin precipitation.

Cholangitis and cholecystitis may be the result of extension of infection from the duodenum from continuity of structure, or by localization of bacteria circulating in the vascular and lymph channels. Whenever biliary stasis occurs—*i.e.*, when the emptying of the gall-bladder is delayed or prevented by obstruction of the common duct—then the mucin present in the bile undergoes decomposition and its antiseptic action is suspended. When this occurs the bile naturally undergoes certain changes, the lecithin no longer holds the cholesterin in solution, the antiseptic effect of the bile is destroyed, and if bacteria be present infection supervenes. The antiseptic action of normal bile is sufficient to destroy invading bacteria under ordinary circumstances. It has been experimentally shown that virulent bacteria injected into the healthy gall-bladder will not produce concretions in the presence of normal bile. If the mucosa be already damaged, or the composition of the bile changed, infection occurs and the formation of concretions results. On the other hand, it is claimed by certain observers that during their experimentation bacteria isolated from the gall-bladder mucosa injected into the blood stream, regardless of location, produced infection of the hepatocystic tract in forty per cent of instances. I do not believe this means there is a specific gall-bladder microörganism, but probably the gall-bladder is the most suitable habitat for the microörganism which produces both physical and chemical changes. Possibly the irritation produced by infection of the gall-bladder mucosa causes an increased excretion of various fluids, particularly the nucleo-albumins and calcium molecules, thus favoring the precipitation of cholesterin.

Osler states that two hundred and forty of Deaver's cases of gall-stones were examined for microörganisms, and fifty-two per cent showed sterile cultures; thus in the majority of his cases infection was evidently not a factor in the production of biliary concretions. In sixty-eight cases colon bacilli were present; in others staphylococci, streptococci, and other bacteria were found. The fact that in the majority of instances no bacteria were present certainly minimizes the rôle of infection in the etiology of gall-stones. Microörganisms may be a factor in the production of biliary concretions, not because they are microörganisms, since

virulent bacteria may be injected into the healthy gall-bladder without producing concretions, but because they may induce changes in the mucosa or the biliary secretion favoring the precipitation of cholesterin and other solid constituents—acidity or alkalinity.

Biliary concretions are ninety per cent cholesterin, which chemically is simply a triatomic alcohol. Bilirubin-calcium and some other solids have been found in gall-stones. Bilirubin-calcium in gall-stones occurs in the proportion of from thirty to ten per cent. Biliary concretions may vary in size from millet seeds to an enormous mass completely filling the cavity of the gall-bladder. When it is considered that ninety per cent of this mass consists of triatomic alcohol, which may be easily dissolved by the employment of certain chemical agents, it does not seem unreasonable to presume that such concretions are usually disintegrated within the human body.

In the medical treatment of cholecystitis and cholangitis complicated by gall-stones, the bismuth preparations seem decidedly harmful instead of beneficial. There are several drugs which are supposed to enter into combination with the biliary constituents, and the specific action of these various medicaments may be thus secured. Of these drugs perhaps the valerianate of amyl offers the most promising results. It not only acts as a sedative and quiets the muscular spasm, but also has a solvent effect upon cholesterin; for these reasons it should be used in all cases instead of morphine, which has been most highly recommended. Of the various fatty substances or oils which have been advocated, glycerin is now coming into prominence. As lecithin is a normal constituent of bile and also a solvent of cholesterin, any medicament containing lecithin is indicated. The explanation of the tremendous popularity of olive oil in the treatment of gall-stones is because of the large percentage of lecithin it contains.

It must be remembered that cholesterin is not a product of the hepatic secretion, that it simply represents disintegrated tissue from various structures and is excreted by the liver. Lecithin is the material which holds in solution various solid biliary constituents, besides its detoxicating and lipoid effects, therefore the administration of lecithin-containing medicaments is certainly the most rational therapy.

It has been said that anything which will increase the circulation of blood through the abdominal viscera will augment the biliary secretion. For instance, a full meal increases the quantity of blood in the abdominal viscera, and the secretion of bile is immediately increased. The bile begins to discharge so soon as the stomach is filled with food, and reaches its maximum after the fourth hour. It has been suggested that the mucin contained in the bile is a substance similar to secretin, or a hormone accumulated during the period when the gall-bladder is inactive. When the stomach is filled with food, the secretin or hormone begins to perform its function. In a few hours the mucin or secretin gradually becomes less, but until the bile has ceased discharging it is found present. The administration of gamboge will irritate the gastric and duodenal mucosa and thus cause an increased quantity of blood to circulate through the abdominal viscera. Under these circumstances no increase in the biliary secretion occurs, hence there must be a different action dependent upon the effect of the secretin or hormone, and not upon the quantity of blood circulating.

As to surgery, when medical treatment has proven ineffective. In a recent paper Mayo shows forty per cent of cures from cholecystostomy, and seventy-one per cent from cholecystectomy. Of the cholecystostomy cases, only forty-eight per cent were found to have biliary concretions when the gall-bladder was opened. Thus more than fifty per cent of the patients merely had symptoms or manifestations resembling those due to gall-stones. In the cholecystectomy cases there were also a number without gall-stones, which would reduce the cured gall-stone cases to approximately twenty-five per cent. Therefore it would appear that medical treatment is indicated in at least seventy-five per cent of cases, if

the presence of gall-stones may be considered the basis of surgical intervention.

There should be a correction of all mechanical predisposing causes of biliary concretions, such as pressure from various anatomical displacements, etc. Regulation of the diet is of the utmost importance. If, as has been claimed, biliary concretions owe their origin to the increased acidity or alkalinity of faulty metabolism, then proper correction by dietary and hygienic measures would be the height of wisdom. That the patient should be placed upon a strictly antiuric acid dietary seems absolutely essential.

If increased activity and regulation of the biliary secretion can be obtained through the action of the hormones, then it would seem that organotherapy should be decidedly beneficial in restoring and maintaining the secretion to the normal standard. It must not be forgotten, however, that the most effective solvent of gall-stones known is normal bile. Where the effects of bacterial invasion can be minimized, and normal biliary secretion reëstablished, decided advantages are gained in the medical treatment of gall-stones.

It must not be inferred from the foregoing that I am trying to maintain the position that surgical intervention is never necessary in the treatment of gall-stones. Where suppuration has ensued, and the patient exhibits unmistakable evidence of decided toxemia, while many times medication may relieve the existing symptoms, drainage may be essential. Under such circumstances the aid of surgery should be invoked, provided permanent improvement is not obtained by medical treatment. In my experience, however, the majority of patients have not exhibited such symptoms. The disease being decidedly of the subacute type, only occasionally have chills, fever, and other manifestations of toxemia been noted in patients with cholecystitis and cholangitis. Moreover, it has been my observation that severe symptoms have occurred oftener in cases in which inspissated bile, rather than the definite formation of gall-stones, represented the essential pathology.

FURTHER EXPERIENCE IN THE TREATMENT OF INTRACRANIAL HEMORRHAGE IN THE NEW-BORN.

In the *Boston Medical and Surgical Journal* of June 29, 1916, GREEN reaches these conclusions:

1. Intracranial hemorrhage in the newborn may be most conveniently classified clinically under two groups—infratentorial and supratentorial.

2. In the infratentorial type of hemorrhage the symptoms and signs are primarily respiratory in character and are probably dependent on the pressure of accumulating blood about the respiratory center in the medulla.

3. In the supratentorial type of hemorrhage the symptoms and signs are primarily convulsive and are probably dependent on the irritation of the motor area by accumulation of the blood over the cerebral convexity.

4. In any case of doubt, diagnosis should be confirmed by exploratory lumbar or cranial puncture, or both.

5. In the infratentorial type of hemorrhage repeated lumbar puncture is probably the best palliative treatment and may prove definitely curative.

6. In the supratentorial type of hemorrhage, the best treatment is incision along the coronal suture at one or both lateral angles of the anterior fontanelle, followed by brief drainage with rubber tissue.

7. More extensive procedures than that above outlined are unnecessary and likely to prove fatal.

8. Early diagnosis, and operation within the first two or three days of life, are essential for the best results, since in such cases the blood still remains fluid and there is prospect of its complete removal by drainage. The prognosis becomes steadily worse as time progresses, since the clotting of a considerable amount of blood makes such complete removal impossible, and even if the baby recovers, there is much greater likelihood of subsequent adhesions and irritative Jacksonian phenomena.

EDITORIAL.

ALCOHOL AND NARCOTICS.

At various times in the past we have called attention in these columns of the GAZETTE to papers more or less scientific in character which have dealt with the subject of alcohol and narcotics, principally with alcohol, and we have endeavored to deal with the matter in a judicial spirit in order that our readers, being medical men, might have presented to them an array of facts upon which they could base their own opinions in regard to the important problems which are at stake. At the present time human beings in all walks of life can be divided into several classes in regard to the matter of the use of alcohol. A very large percentage of the human race employ alcohol in amounts which are moderate, and a comparatively small percentage abuse it by taking it in quantities which are immoderate. At the other extreme we find a comparatively small number of people who not only absolutely condemn its use for themselves, but, with the ardor of fanatics, seek by legislation to prevent its ingestion by all other individuals. There is still another class of persons, and these are very numerous, who rarely employ alcohol in any form but who have no objection to taking it occasionally or to seeing their fellows employ it constantly, provided that its employment is not abused so that others, who have not happened to take this liquid at a given time, do not suffer from the action of the individual. It is from this middle class that those who believe that individual liberty as to food and drink should not be limited receive a good many votes in their support, and it is also from this class that the enthusiastic prohibitionist not rarely obtains a large number of recruits.

The problems connected with the use of alcohol are so large and numerous that it is manifestly impossible to consider them all in an article like this. Only those points which are most closely associated with medical practice can claim our attention.

In the issue of the *Interstate Medical Journal* for June, 1916, a number of valuable papers upon this subject appeared, and, taking them as a whole, it may be stated that they present fair arguments for and against the use of alcohol, although the active prohibitionist will be disappointed in that they do not go as far as he would like them to. We think that the editor of the *Interstate Medical Journal* sums up the matter pretty fairly when he states that if alcohol, tea, coffee, and tobacco are swarming with the death-dealing qualities, which some writers say they are, then a very limited quantity of each would be a poison, but this is not true since in many instances the sane use of them results in a physical and mental relaxation that has nothing objectionable about it or harmful to the system, except in the thought of some easy-chair philosopher whose mind is bathed in the turbid waters of Puritanism.

One of the most interesting papers is that which is contributed by Patrick, Professor of Philosophy of the University of Iowa. Concerning the use of alcohol, tea, coffee, and tobacco, he states that it is strange that in all the great mass of writings on this subject so little attention has been given to the psychological problem, which is fundamentally the whole discussion, namely, the problem of the cause of the desire for these drugs. He points out that the American people are now consuming annually about two thousand million gallons of alcoholic liquors, half a thousand million pounds of tobacco, a thousand million pounds of coffee, and nearly a hundred million pounds of tea, and if this is the case it must be evident that these substances are taken not as luxuries or as evidences of vice, but that the demand is rooted somewhere in the brain cells of human beings.

It is interesting to note that the physiological action of these several substances is not only different in degree but different in kind. It has been proved beyond all doubt that alcohol diminishes functional efficiency in practically every portion of the body. These facts have been used by those who

condemn the use of this drug as indicating that it should never be employed, whereas, as a matter of fact, these facts indicate only that it should not be employed when full efficiency is desired, and that it may often be employed with advantage as an agent of relaxation and for the purpose of benumbing or controlling mental or nervous phenomena, which have been put into excessive activity under the stress of daily life. On the other hand, all the scientific investigations which have been made, which are worthy of credence, show that tea and coffee are stimulant in their effects, and within certain bounds, if associated with proper food and rest, actually temporarily increase efficiency without harm, but the man who uses alcohol when at work does not take it to diminish his efficiency, and certainly the ordinary individual who works for some one else rarely manifests a desire to take tea or coffee to increase his efficiency. As a matter of fact, therefore, persons who use these drugs have found by experience that their employment in moderation adds to the comfort of existence, and while they may not be able to give very lucid descriptions of the feelings which these drugs induce, the fact that they are so universally employed is a tribute to their good effects. It is also possible that the use of all these substances, whether they be stimulant or depressant in their nature, seem advantageous to the economy in that they diminish activity in parts which have been excessively active and increase activity in other parts of the body, which, for the time being, have been quiescent. As Patrick puts it, alcohol places a temporary quietus upon the higher control of the brain centers and sets free the older and more basal centers, and so is a release from the burdens of the modern strenuous life.

Again, it is well known amongst active mental workers that prolonged and intense cerebral activity produces a certain amount of cerebral congestion with a corresponding anemia of the feet. When the time comes for ceasing work the brain tends to continue in its activity and the feet are cold. Under these circumstances the use of a moderate quantity of alcohol, by relaxing the blood-vessels in other parts of the body than the brain, equalizes the circulation, draws blood away from the brain, permits rest, and often causes sleep. To quote Patrick again, "alcohol and tobacco are generally an easy means of rest and relaxation; putting to sleep in a measure the higher brain centers while allowing the needed activity of the lower ones."

We come in contact, of course, at this point with the important factor of common sense, both as to work and relaxation. The man who works to excess, mentally or physically, does himself harm, and he who uses alcohol, or any other drug, to compensate for such excess is simply putting aside the evil day of reckoning. If he goes so far as to employ these substances in inordinately large quantities he does not put off the day of reckoning but actually hurries its approach. In other words, moderation in all things, whether it be in work, in drink, or in food, is essential for the preservation of health.

At this point those who are opposed to the use of alcohol and the other drugs that we have named state that the fundamental difficulty lies in the fact that certain human beings are unable to exercise self-control, and that under these circumstances laws should be passed which will control them. The vast majority of persons who take alcohol, tobacco, tea, and coffee do exercise self-control, and only a comparatively few consistently step over the boundary line of common sense in their use. Many of these persons are distinctly abnormal and the recognition of this fact is one of the reasons why many physicians and others do not believe that laws should control the personal liberty of the many for the benefit of a comparatively few, who are imperfect.

In this connection a paper by White, who is Superintendent of the Government Hospital for the Insane in Washington, is to the point. He believes that alcohol is not a habit-forming drug, but rather that its use in excess—that is, to the degree to produce what is known as alcoholism—is a symptom of some underlying functional condition

which has escaped our notice, and he quotes Haycraft, who, after making a statistical study of the effects produced by prohibition in several States, found that as the consumption of alcohol had been diminished and as drunkenness had been lessened, the admissions to the insane asylums and poorhouses had progressively and correspondingly increased. In other words, the conclusion would seem to be that given a number of mental defectives these persons, when unable to indulge in alcohol, nevertheless progressively diminish in efficiency and develop frank mental disease, or that type of deficiency which leads to pauperism. White is convinced of the truth of this view and quotes the President of the Society of the Study of Inebriety as having positively stated that he had never seen an inebriate who, aside from his inebriety, was a normal man. White believes that inebriety is to be considered as a neurosis, characterized by an all-pervading feeling of inefficiency, and he considers that this inefficiency is characteristic of the man who abuses alcohol. He is incapable of meeting reality efficiently every day. He may be able to deal with the problem of reality for a greater or less length of time, but continuity of effort, day in and day out, is foreign to the alcoholic character. We think that most physicians of experience will agree with this view. It is his desire, being abnormal, to fly to the cover of the narcotic to escape the overburdening oppression of reality, and the fully developed type of this individual is he who, not drinking with his fellows, every now and then shuts himself up in his room and drinks himself into unconsciousness. Alcohol, therefore, does not produce a habit, but a habit of mind, and a deficient morale induces a more or less habitual use of the drug. It would seem to be evident, therefore, that Morris is pretty nearly correct when he states that alcohol does about everything that its friends claim for it and about everything that its enemies claim for it, depending, of course, upon the person who uses it and how it is used.

Concerning the important question of the influence of alcohol upon heredity, there are two other papers which must be considered, and which approach the subject from somewhat different points of view. One of these is contributed by Stockard, who has used an immense number of guinea-pigs in an endeavor to determine whether alcoholism in the parent influences the offspring. It is evident, of course, that results obtained in the offspring of guinea-pigs which have been subjected to the influence of alcohol may be quite different from the effects which develop in the offspring of human beings who abuse this drug. It is conceivable that alcohol may affect the development of the guinea-pig as differently from the development of the human being as hay as food would affect the guinea-pig as compared to its effect if ingested by man, and it would seem probable that the history of the human race proves pretty conclusively that alcohol taken by either parent does not exercise the deleterious effect upon the offspring in human beings that it does in guinea-pigs. If it did the number of defectives in the children of alcoholics would be far greater than it is.

Stockard's experiments are of great interest and add great value to our knowledge of an important subject, but they do not afford actual evidence as to the effect of alcohol upon human heredity. Aside from the difference as to the effect of alcohol in guinea-pigs and human beings, it is to be noted that very few human beings who reproduce are as completely alcoholized at the time of impregnation as were Stockard's guinea-pigs, since these animals were kept for days and weeks in a condition of chronic intoxication. Furthermore, Stockard found that the dose of alcohol, which he wished to give, when administered by the stomach produced such deleterious effects upon his animals that this method of administration could not be employed, and he therefore devised a method by which the animals were exposed to the fumes of alcohol while in their cages. The drug was taken into their bodies therefore when they breathed the vapor of the drug through their lungs, and not by their stomach and through the liver.

As the liver is the great oxidizing organ of the body it is quite conceivable that the action of alcohol vapor continually inhaled may produce very different results from alcohol taken by the mouth in more or less widely separated drinks, and this is the more likely when we find, to use the words of the author, that "several of the guinea-pigs have been treated with the fumes of alcohol almost to the point of intoxication for six days per week for a period of five years." It is not surprising that under these circumstances the progeny of these animals, in many instances, died soon after birth, or were disitnctly defective at birth, but it is surprising that he was unable to find anything abnormal in the heart, stomach, lungs, kidney, and other organs that might not be found in a normal individual. This proves that alcohol by the lungs and alcohol by the mouth produces different effects. His belief would be that alcohol, taken in the way in which he gave it, influences the germ cells but not the tissues of the vital organs.

It is interesting in comparison with this experimental study to note the conclusions of Goddard, who is the Director of the Department of Research of the Training School for Feeble-minded Children at Vineland, N. J. He takes issue with Stockard's conclusions as to the effect of alcohol upon heredity. Studying human beings he found that alcoholic parents average 5.5 children to a mating and the non-alcoholic average 4.1. Analyzing these two groups, which consisted of several thousand children, he found that in the alcoholic group 31 per cent were feeble-minded, whereas in the non-alcoholic group only 18 per cent were feeble-minded. While at the first glance this would seem to indicate that alcoholics are predisposed to the production of feeble-minded children, it must not be forgotten that those parents who used alcohol to excess were, in the great majority of cases, more or less defective, because if they had not been defective they would not have abused the drug, and therefore Goddard concludes, as a result of his investigation in human beings in distinction from guinea-pigs, that alcoholism is to a very large extent due to feeble-mindedness, and furthermore, that his statistics have failed to show that alcoholism of the parents causes feeble-mindedness in the children. He believes that this feeble-mindedness is accounted for by heredity and neuropathic ancestry, and he well says that at the present time the facts at hand do not permit the solution of the important question of the effect of alcohol upon the health of offspring.

DIAGNOSIS AND TREATMENT.

Practically all of the laity seem to believe more thoroughly in the selective affinity of drugs for diseased tissue than do medical men, although the laity have no scientific knowledge and medical men possess a good deal of it. Occasionally one meets with a practitioner whose abiding faith in this selective affinity is encouraging, were it not that he has little or no scientific basis for his view. In some instances what has appeared to be the result of the selective affinity of a drug for a diseased tissue is nothing more than a coincidence, or some change takes place in the function of certain organs of the body as a result of natural processes and not directly the result of the administration of the drug or drugs.

These preliminary remarks are made for the purpose of insisting upon the obtaining of an accurate diagnosis, whenever this is possible, before remedial measures are resorted to, since otherwise the treatment is haphazard, to say the least, and in the great majority of cases must inevitably fail. It is true that not infrequently drugs may be given for the relief of pressing symptoms with success, and this may lead the practitioner and the patient intc the belief that a cure has been effected. This belief, as a rule, ultimately results in disappointment, since nothing has been done for the relief of the underlying condition. Headache, neuralgia, impaired digestion, cardiac irritability or irregularity, can, all of them, be temporarily relieved, to some extent at least, by the use of certain drugs, but they will not be

permanently relieved unless the underlying anemia in some cases, gouty tendencies in others, or constipation in still a third class of cases, is corrected.

There are two general classes of cases in which thorough methods of diagnosis are not as frequenlty resorted to as they should be before the institution of treatment. It not infrequently happens that the urine of a patient is examined only once, and, still worse, that this sample is that of only one urination rather than a sample from a twenty-four-hour specimen. Such an examination may lead to the belief that there is nothing wrong with the kidneys, or, on the other hand, a particularly bad specimen may give rise to the opinion that the kidney condition is exceedingly grave. Not only is this true but the reaction of the urine, and the time that it is kept, are not so important in themselves as in the influence which these factors may exercise upon the discovery of casts. Thus, it sometimes happens that a twenty-four-hour specimen of urine which is alkaline is found to be quite free from casts because the casts have been dissolved in the alkaline liquid, whereas if the urine were examined immediately after it is passed, or maintained at proper temperature to prevent putrefactive change, or again acidulated to preserve it, an entirely different urinary report would be obtained and a different idea of the complexion of the case would be formed in the physician's mind.

So, too, in cardiovascular disease the estimation of the blood-pressure and the action of the heart of a patient on a single occasion, particularly when he is being examined for the first time, and if he has walked to the doctor's office, may give an entirely erroneous conception of the average condition of the patient and lead to the institution of active therapeutic measures which are excessive for the patient's ordinary needs, or which, perhaps, are not needed at all.

The demand on the part of the physician for a number of twenty-four-hour samples of urine, or his request that a number of cardiovascular examinations should be made before he is asked to express an opinion and direct treatment, is often received with disfavor by the patient, who naturally is impatient of delay and who has no idea of the various problems involved in the proper investigation of his case.

On the other hand, while the investigation of a case with instruments of precision or by laboratory methods is wise, in many instances, it is a noteworthy fact that he who is particularly adept as to laboratory detail is often unsuccessful because he has not trained himself to regard the patient as an individual with peculiarities, or one presenting the picture of a definite type of disease.

In other words, it is necessary for the modern medical man to balance the older methods of clinical observation with laboratory and instrumental control.

So, too, it not infrequently happens that a patient will present predominant symptoms in a given organ which are not due to any primary disease of that organ, but which are secondary to a lesion or lesions elsewhere. It is by no means uncommon to see a case of chronic bronchitis treated with various expectorants for weeks without results, when a thorough examination of the patient would have revealed that the bronchitis was really due to some condition of the heart or kidneys, and so it will happen that one physician will fail to relieve a patient suffering from this type of bronchitis by the use of expectorants, whereas a more careful man will immediately give him relief through the employment of rest and digitalis.

Not long since, as illustrative of the need of careful examination before prescribing, the writer of this note saw a man of fifty odd years, with a life history which would predispose to the development of angina pectoris, who complained of severe pain in the chest, about his heart, and radiating down his left arm, which was increased by exercise or the taking of a full breath. The administration of the nitrites gave no relief, but twenty-four hours later, when the patient arose in the morning, he found a sharply defined line of irritation extending

along the margin of his fifth rib, and then it became evident that the attack of so-called angina was in reality a herpes zoster. The possibility of herpes zoster is also to be regarded in severe cases of supraorbital neuralgia which has lasted for only a few hours.

Last of all, as opposed to carelessness in the reaching of a correct diagnosis on the part of a physician, we must bear in mind the difficulties which are presented by reason of the fact that not infrequently a patient deliberately misleads the physician by stating a falsehood, or else is so uncommunicative that it is almost impossible to gain accurate information. Very rarely an individual is met with who has so little power of self-observation that he is unable to make statements which are correct concerning himself, or describes his symptoms in a way which makes diagnosis impossible.

The whole point of this article is to emphasize the fact that although it is very easy to write a prescription with the hope of producing a cure, it is important not to write this prescription until the case has been sufficiently carefully investigated to give one a reasonable right to hope that good results will ensue.

THE VALUE OF THE BROMIDES IN THE TREATMENT OF EPILEPSY.

Aside from measures devoted to the regulation of the diet and the maintenance, as nearly as possible, of a good nervous equilibrium, it may be truthfully said that we can do little for the relief of idiopathic epilepsy, particularly by the administration of drugs. Many years ago, as the result of a careful investigation of this subject, it seemed to us clear that the bromides, although only palliative remedies, nevertheless occupied the highest place in the drug treatment of this malady, and in summarizing our knowledge at that time the writer of this note pointed out that, while every voice in the profession supported the use of the bromides, these drugs were not to be considered as curative. Some years later we published in the THERAPEUTIC GAZETTE facts brought together by collective investigation carried out amongst the superintendents, or general medical officers, of asylums for the insane and epileptic. This collective investigation showed very conclusively that no one believed that the bromides were at all curative in their influence, and also revealed the fact that all too frequently the general practitioner was in the habit of administering these remedies over too long periods of time or in such large doses as to make their ultimate effect distinctly deleterious. Indeed, at least one of the institutional medical officers, to whom we have referred, expressed the belief that if the profession in general could be taught the wisdom of refraining to a large extent from the administration of the bromides to epileptics, a distinct service would be rendered to these unfortunates.

Still later we called attention to certain types of maniacal disturbance which very occasionally occur in persons who have an idiosyncrasy to the bromides. Thus, Weir Mitchell reported the case of a woman who while in Paris became violently insane while taking the bromides, these symptoms continuing until her return to this country, when, on ceasing the bromides, her mind recovered. These cases are very rare and are diametrically opposed to the very common instances of mental failure or dementia which are met with in patients who have been saturated with these remedies. In many instances the mental failure is attributed in a large degree to the epilepsy, when, in reality, it is due to the drug.

In the *Medical Review of Reviews* for July, 1916, Shanahan, who is in charge of the Epileptic Asylum at Sonyea, N. Y., wrote upon this topic and insists upon the view that epilepsy is a disease of the whole man and not of any one organ or system of organs. He insists upon the moral treatment of epileptics in regard to self-control, personal discipline, and strict rules of conduct, and he also states that the bromides may mask symptoms of the underlying causes of disorder. This is particularly to be borne in mind when treating patients who have paroxysms at long

intervals and, therefore, take an immense amount of bromide needlessly during the intervening periods.

Again, it is important to remember that if an epileptic who has been taking full doses of bromide stops taking them there is often an increase in the number of seizures and not infrequently a true status epilepticus develops. It is evident, therefore, that when these drugs are to be stopped in a case of epilepsy they should be withdrawn gradually and not at once.

Finally, Shanahan presented the following interesting facts. He stated that in the Craig Colony for Epileptics the average amount of bromine and bromide salts used per patient during the year 1902 was 10.8 ounces, and the average number of seizures during that year was 98. In the year 1904 the average dosage was 15.6 ounces, and the average number of seizures 124. In 1906 the average dosage per patient during the year was 12.2 ounces and the average number of seizures 136. Since 1908 there has been a marked lessening in the administration of the bromides, so that the average dose for the entire year has been less than half an ounce, and it is interesting to note that with this remarkable reduction in the amount of bromides there has not been an increase in the average number of seizures. On the contrary, during 1915 there were 95 attacks with the average per capita dosage of bromide at 0.45 of an ounce.

How much this remarkable change, as represented by these statistics, depends upon other factors than diminished use of the bromides is open for debate. It is conceivable that the institution may have been fortunate in having a fairly large number of patients who only have paroxysms at long intervals, or who may have received other treatment when they had not as yet passed into a state of chronic epilepsy. Furthermore, Shanahan's statistics are hardly complete without more information in regard to the age of the patients, since epileptics who have reached mature years are notoriously less responsive to treatment than young persons and, as a rule, present signs of mental and nervous deterioration.

Whatever the correct conclusion may be in detail it would seem evident that bromides cannot be used in epilepsy carelessly and that their effect should be closely watched.

This editorial note was written before we received for publication the article by Dr. Shanahan which appears in this issue. His communication is so practical and useful that we desire to call attention to it in these columns.

THE RESULTS OF TREATMENT IN FRACTURE OF THE LEG.

Since the gauge of treatment lies in the percentage of good functional and, if possible, cosmetic end results, an adequate series of cases carefully observed and systematically reported is always of major interest. Hence Clough's (*The Journal-Lancet*, Sept. 1, 1916) series of 100 cases of fractured leg which occurred amongst underground workers for a mining company is important because he has so carefully treated them and because accurate records have been kept of all time lost from work; therefore the period and degree of disability can be accurately determined. The injuries he studied were mainly due to rolling rocks, and for the most part the tissues were not crushed lifeless as in railroad work; yet because of the heavy jagged rocks the most serious kinds of compound fractures were produced. Most of the fractures occurred between the twentieth and the fortieth year, these probably representing the average age of the larger number of employees. There was no difference in the two sides of the body.

The author tabulates the average time lost according to the kind of fracture. This is something over 71 days in simple fractures, 108 days in simple comminuted fractures, and 163 days in compound comminuted fractures. When both bones are broken simple fractures result in the loss of 117½ days, comminuted fractures 119.9 days, and compound comminuted 168½ days. It is noted that for every dollar the workman loses in wages the company spends an equal amount in getting him well.

On this basis it is possible to work out, in dollars and cents, the cost of these injuries. The average wage paid to underground workers by the company is $3.25 per day. The total net cost of a simple fracture is $395; of a comminuted fracture $594; of a compound comminuted $899; simple fractures of both bones cost $645; compound comminuted of both bones cost $926. The shortest case when both bones were involved cost $416, and the longest case cost $1841; the average case costing $542.

Conservative methods were followed as far as possible. There were three deaths—one from pyemia, one from pulmonary tuberculosis, and one from pneumonia.

On several occasions while waiting for wounds in compound fractures to heal in order to permit of operative methods on the bone, nature stepped in and good union was obtained where it was supposed that the suppurative process was too great to permit of formation of callus. As a result of this the writer is certain that many cases of delayed union at the end of six or eight weeks would have later become solid by conservative methods had they not been operated upon when they were found springy. He is strongly of the opinion that, if repeated efforts are made, the great majority of recent fractures of the leg can be put into line and held there by conservative methods.

Absolute anatomic reduction is not necessary in recent fractures of the leg, nor is the healing process accelerated by accurate apposition. If the fractured ends are side-slipped a third or even a trifle more a stronger callus is thrown out, and ultimately the callus becomes smoothed down, the lines of force of the bone become readjusted to new conditions, and inside of two years it is impossible to tell by appearances where the fracture occurred, and all the *x*-ray shows at this late date is a slight thickening of the cortex at the seat of the old injury. It requires as much experience and greater attention to detail to handle fractures by the conservative method as by the open method.

The majority of cases were reduced under ether anesthesia. Most of the men were dirty when hurt, and the legs were washed before applying splints. If a wound was present, it was temporarily covered during the washing process, and then swabbed around the edges either with soap and water or, more recently, with iodine. No appreciable superiority has been seen in either method. No attempt was made to wash the wound below the surface, and common sense teaches the removal of any foreign bodies. Splints were made of pasteboard, one on each side of the leg. When a part reached normal size the pasteboard splints were replaced with the ordinary plaster-of-Paris casing, which remained *in situ* until good union was secured. This case is cut open immediately after being put on, and is wrapped with a muslin bandage, in order to allow for any possible swelling.

Almost without exception every patient returned to the same class of work he was doing before the receipt of the injury. Very oblique fractures were the most difficult to handle.

Whilst the anatomical results have not always been ideal, the functional results have been satisfactory. Fractures involving the upper part of the leg are always characterized by slow union.

Tetanus has never occurred in over 30,000 recorded accident cases, hence no antitetanic serum was administered as a prophylactic measure. The author is unable to find a single instance of tetanus reported by mining surgeons, from which he concludes that the germ does not live under ground. Six patients in all were operated upon—two for non-union, two because they could not be reduced, and in two amputation following infection was required.

It will be remembered that Championnière rudely disturbed the accepted belief in regard to the proper treatment of fracture in that he urged mobilization in place of fixation, holding that the latter if absolute retarded or even prevented union. It is quite true that function is the immediate object of the treatment; that the sooner and the more completely it is restored the more successful the treatment; and that Championnière had in view the preservation

of the soft parts without interfering with the union of the bone when he argued so strenuously against immobilization. In so far as massage is used in the treatment of fractures, and this applies both to the period shortly following injury and to that later period when efforts are made to increase a limited motion, its efficiency depends upon its painlessness and the sense of relief experienced by the patient after its application. If these two requisites be kept in mind there is no reason why massage should not be applied immediately after the infliction of the fracture. Indeed there are a number of reasons why it should be so used, since it encourages local circulation and thus the rapid absorption of clot and the formation of granulation tissue and of callus.

Bardenheuer's method of treatment is based on traction. Properly applied it avoids muscular stiffness and joint adhesions and allows of massage and passive movements, and is attended by the minimum muscular atrophy and leads to a very accurate adjustment of the fragments, although, of course, they are practically almost never immobilized. Such traction is applied as is adequate for the reduction of the deformity; the pull may be in one, two, or three directions, according to the indications. The method is fairly easy of application even to the upper extremity, and sometimes the only one which will secure and maintain a proper reduction in fracture of the surgical neck of the humerus.

BRAIN TUMOR.

To those at all familiar with the clinical aspects of brain tumors, their distressing progress, their fatal termination, and with the somewhat appalling mortality of surgical intervention, the summarization of the work of a single clinic is of real and practical interest. Thus the excellent clinical study of this lesion based on 70 carefully studied cases contributed by Heuer and Dandy from the surgical service of the Johns Hopkins Hospital (*Johns Hopkins Hospital Bulletin*, No. 306, 1916) is worthy of careful reading and of high commendation. Of the thirty cerebral and brain stem tumors certified by operation or autopsy, including tuberculoma, cyst, endothelioma, glioma, aneurism, and internal hemorrhagic pachymeningitis, 27 were operated on, with a mortality of something over 6 per cent, a case mortality of something over 7.4 per cent, and with 8 apparently well on discharge.

Of 12 cerebellar and cerebellopontine tumors certified by operation or autopsy, of which 6 were cysts, 1 a cyst glioma, 1 a glioma, 2 endotheliomata, and 1 an instance of ependymitis with internal hydrocephalus, 11 were operated upon, with an operative mortality of something over 15 per cent, a case mortality of 18 per cent. Six of these were apparently well on discharge.

Of 16 presumed cerebral tumors, not certified, 15 cases were operated upon without operative mortality, and 10 improved; the operations being exploratory decompression, or being limited to, in one case, ventricular puncture. Of 12 presumed cerebellar and cerebellopontine tumors not certified, 9 were operated upon, 4 being reported not improved. The operative case mortality was 22 per cent. There was no operative mortality in the presumed cerebral tumors.

The reasons for including conditions other than tumor in the tabulation are based on the circumstance that the symptoms so closely simulated those of tumor that operations were usually performed under the supposition that new growth was present. Taking the total number there were six deaths occurring between twenty-four hours and five days after operation—an operative mortality of 8.6 per cent. Two patients subsequently died in the hospital, this termination being apparently uninfluenced by operative procedures. There was a complete operative mortality of 11 per cent. No case died on the operating table.

In 33 cases the lesion was disclosed at operation—that is, in 53 per cent of the cases operated upon. The operation consisted in attempting to remove the lesion in

28 cases; in 7 the removal was but a partial one. Gliomata formed 50 per cent of the total lesion in the series reported. Of the gliomata 6 were cortical, 7 subcortical. In consistence they varied from relatively hard to extremely soft gelatinous growths resembling a colloid carcinoma.

Of 11 cysts, 7 belonged to the group of simple serous cysts, 1 arose from an embryonal anlage, and three were arachnoidal cysts. Five of the 7 simple cysts arose in the cerebellum. They exhibited gelatinous walls usually separated from the surrounding brain tissue and a yellowish or slightly brownish fluid which, rich in fibrin, rapidly clotted on exposure to the air. The arachnoidal cysts usually arise as a consequence of infection, as from the ear or from trauma. They represent a local collection of the cerebrospinal fluid enclosed by thickened, opaque pia-arachnoid. Distended cisternæ should not be mistaken for these cysts. Four cases of endothelioma serve to illustrate the fact that they may be multiple, and unless removed with a wide area of attached dura they are prone to recurrence. At times these tumors are bilateral in the cerebellopontile angles. Of the tuberculomata both were solitary tumors.

The authors reëmphasize two of the possible causes of late interference in brain tumor cases. It has been repeatedly noted, yet it is not generally known to the profession, that even a high grade of choked disk is not incompatible with good vision. It is probable that if surgical measures were contemplated and indeed applied as soon as choked disk can be diagnosed blindness would in a large measure be prevented. The demonstration of a normal visual acuity, as tested in the normal way, should not be taken as ruling out visual disturbance; it is only by careful perimetric examinations that early disturbances in vision can be demonstrated. Contractions in the color field occur before alterations in the fields for form; and both may occur long before visual acuity as tested is demonstrably affected.

The assumption, still too prevalent, that intracranial lesions are commonly of syphilitic origin is another cause of delay in bringing cases into surgical hands. Cerebral syphilomata are rather uncommon as compared with the true tumors. The Wassermann test was made in 52 cases; positive in but three. The absence of the positive Wassermann reaction, with one exception, in a series of 28 certified cases of true tumor, argues well for the value of this test in excluding luetic lesions. Of course syphilis and brain tumor may coexist. The *x*-ray still finds its greatest field of usefulness in the diagnosis of hypophyseal lesions not only in their localization, but, in the associated deformities of the sella turcica, in the determination of their size, direction of growth, and occasionally of their character. Tumors producing a definite shadow are, unfortunately, uncommon, but changes in the skull, such as erosion or thickening, vascular changes, or changes more or less characteristic of internal hydrocephalus, are not infrequent.

The demonstration of an internal hydrocephalus is valuable in cases in which a differential diagnosis between supra- and subtentorial lesion is uncertain. *X*-ray plates are helpful. More certain information is obtained from ventricular puncture, which may be done with or without the injection of phthalein. The only precaution needful is to open the dura sufficiently to see that a cortical vessel is not injured by the introduction of the blunt needle.

As to the operative technique, the approach to lesions and the safe closure of wounds are perhaps of greater importance than similar steps in the treatment of lesions elsewhere in the body. Hemorrhage is one of the most potent factors in the high mortality attending cranial surgery. In 150 cranioplastic operations for brain tumor and epilepsy, a reëlevation of the bone flap was necessary only once because of postoperative bleeding; and in the same number of cases a two-stage operation was necessary but once because of hemorrhage. The authors attribute the absence of postoperative pneumonia to the use of intratracheal anesthesia.

In the treatment of intracranial tumors

only four types of operations may be considered: a decompressive craniectomy done for the relief of pressure symptoms in cases of unlocalizable tumors; an osteoplastic resection for the exposure of cerebral tumors (often combined with a decompression); a cerebellar exploratory and decompressive craniectomy for tumors of the cerebellum and cerebellopontine angles; and the nasal or intracranial operation for the exposure of hypophyseal tumors. In the treatment of cerebral and cerebellar lesions the authors have followed the procedures as developed by Cushing. The subtemporal method of decompression seems the operation of choice for the relief of pressure symptoms due to cerebral tumors. It seems to make no difference whether the subtemporal defect be made over the supposed side of the lesion or upon the opposite side. In spite of great care in the formation of the defect, a temporary aphasia has followed a left subtemporal decompression in two instances.

In the treatment of hypophyseal lesions the nasal approach has been most strongly advocated and most frequently used. Cushing has used this largely; of 124 operations upon 95 patients he has used the nasal approach 111 times. Von Eiselsberg always employs the nasal approach.

Bleeding which resists all efforts for its control, a badly taken anesthetic, or an unusually tense dura, may determine one to abandon the operation for a second sitting, but such complication should be the exception rather than the rule as demonstrated by Cushing's and the present series. In 71 operations done on 62 patients, a two-stage operation was necessary in but a single case, in which a mistaken *x*-ray diagnosis of osteoma of the skull led to an attempt to remove an area of extremely vascular hypertrophied bone before discovering the underlying tumor. None of the six deaths in this series could be ascribed to hemorrhage or shock; and in none of the patients that recovered was the condition such that a blood transfusion was deemed advisable. Careful control of the hemorrhage during approach and careful subsequent closure of the wound were the determining factors in the favorable result.

As to the anesthetic, ether alone has been administered by the usual drop method and by intracheal insufflation. The difficulties attendant upon the brain tumor cases have been very largely eliminated. A smooth, even anesthesia, without straining or cyanosis, is the rule. There is also thus provided an easy method of artificial respiration without change of apparatus should respiratory palsy occur. The authors have discarded the tourniquet around the head and prefer to clip the bleeding points in the scalp, securing these latter by skin suture. Hemorrhage of the bone is controlled by wax, and from the dura by ligature or the silver clips. Under conditions of increased intracranial tension, the opening of the dura becomes an important step in the operation and may result in rupture of the cortex or sudden dislocation of structures leading to respiratory paralysis. The relief of tension may be accomplished usually by one of four procedures having for their purpose the withdrawal of cerebrospinal fluid; ventricular puncture, lumbar puncture, tapping of the posterior median cisterna, and the gradual withdrawal of fluid between the meninges through a minute opening in the dura. Of these procedures ventricular puncture has perhaps the greatest field of usefulness, being applicable for the relief of dural tension in both cerebral and cerebellar explorations. In the location of subcortical lesions palpation and aspiration are our most useful aids; occasionally the local flattening and widening of the convolutions over a growth give an indication of its presence. Palpation of the cortex is difficult and often misleading. By the use of palpation and aspiration nine subcortical cysts or cystic gliomata were discovered.

Although our chances of a cure by extirpation of the tumor are at present few, practically every operation may be converted into a palliative procedure; and in fully 50 per cent of all cases amelioration may be expected. Glioma, the most common type of cerebral tumor, is the most

unfavorable for operative removal, though occasionally it may be shelled out. Endotheliomata are distinctly favorable tumors for surgical removal. They are often very vascular and difficult of approach, since they elect the cerebellopontine angle. Moreover, these encapsulated tumors may be firmly attached by a pedunculated or sessile base to the meninges; and unless the base or origin of the growth is removed, there remains the possibility of local recurrence.

Since cysts tend to refill after evacuation the wall should be removed. Transplantation of fascia has been a helpful procedure used to cover large dural defects left after the removal of tumors.

REPORTS ON THERAPEUTIC PROGRESS.

SOME OF THE USES AND ABUSES OF MASSAGE.

Writing in the *Lancet* of July 8, 1916, CLAYTON says now that massage is used to such a large extent in the military hospitals it seems necessary to point out some of the dangers of using it indiscriminately in all cases. Thus to give massage continuously for months to a patient with a functional paralysis would tend to keep up the disability rather than cure it, because the massage continually reminds the patient of his condition. On the other hand, where a nerve is injured and the muscles it supplies are paralyzed massage is strongly indicated to prevent atrophy and contractures. The following are the treatments which Clayton has found most successful for some of the commoner disabilities that are treated in military hospitals:

1. *Functional paralysis.* In many cases these patients have a considerable amount of rigidity of the back and legs, and this prevents them from sitting up. It is perfectly hopeless to try to cure them with massage. From the start-off efforts should be made to teach the patient to stand and walk. At first two strong assistants are required to hold him up, and usually he cannot move one leg in front of the other. Massage and faradism should be given for the first week or two in addition to the walking exercises, in order to stimulate his muscles and persuade him that he is being helped with treatment. But these must be given up at an early date whether they succeed or not, as they tend after a time to hinder progress. Frequently the patient learns to stand and walk with assistance before the rigidity in his back has passed off sufficiently to allow him to sit up. As soon as possible he should practice walking by himself in some walking machine. Here we have two long parallel bars at such a height and such a width apart that the patient can rest his arms on them comfortably while trying to get his balance. The next stage is to learn to walk in this apparatus without using his arms for support. Finally, when made to walk in the open in all probability he will tend to walk in a circle, but with further training he should learn to walk properly. During all this time he is given exercise on his bed or in a chair for his limbs and trunk, and it is very essential for the masseur to be always very optimistic and suggest to him in various ways that he is improving daily. It is a great mistake to try to get rid of the rigidity and restore muscular power before getting him on his feet. Massage may be continued for months with this object in view without getting any result.

2. *Paralyzed muscles.* (*a*) Due to nerve injuries. The paralyzed muscles should be treated with stimulating massage and galvanism. Passive movements must be given daily to the joints to prevent stiffness, especially if splints are being worn to relax the paralyzed muscles. In addition to this the slightest sign of return of power must be encouraged by giving assisted and active movements to these muscles until they are sufficiently strong for the patient to do exercises by himself. He should then continue with regular exercises until the normal power has returned.

(*b*) Functional. These cases must be treated on the same lines as functional paraplegia. A little massage and faradism at first to stimulate the muscles and suggest to the patient that he is being treated. If this fails to produce any active movement after a short time the treatment must be discontinued and something else tried. Frequently after faradism the patient finds he can do a little active movement. This can be gradually increased and developed by making him practice movements until the full power returns. The success or failure of these cases depends to a large extent on the masseur. He or she must impress on the patient that the treatment is really effecting a cure. Other functional conditions should be treated on the same lines. Massage, if used, is merely to act by suggesting to the patient that he is being treated and recovering.

3. *Flabby heart.* This may either occur after a long illness, such as typhoid fever, or may be the "soldier's heart" due to overstrain. These cases respond well to graduated exercises. In the early stage when the patient is still in bed, massage, in the form of kneading, to the limbs should be also given. Breathing exercises form an important part of the treatment, and the patient should be taught to breathe slowly and evenly while performing the other movements. In almost every case the pulse-rate, if rapid at first, falls during and after the exercises, and it also becomes stronger.

The following is an example of a scheme of treatment ordered for a patient who is still confined in bed: (1) Six deep breaths; (2) arm kneading followed by active elbow flexion and extension (six times); (3) six deep breaths; (4) leg kneading followed by active ankle flexion and extension (six times); (5) six deep breaths. This treatment is gradually increased as the patient becomes stronger, body exercises are added, and the massage is discontinued. Finally, the patient walks up a certain number of stairs daily under the supervision of the masseur, in addition to the other exercises.

4. *Joint injuries.* (*a*) After adhesions have been broken down. The joint is usually swollen, stiff, and painful for the first few days. Passive movements should be commenced the following day to prevent adhesions reforming. Gentle soothing stroking down the limb, performed for five minutes before and while the joint is being moved, will often prevent painful contractions of the muscles and so allow of a freer range of movement. No forcing must be allowed. The movements should be very slow and gentle, and the limb well supported so that the muscles can relax.

(*b*) Chronic traumatic synovitis. For this condition exercises are strongly indicated. Even if fluid reaccumulates they should be continued. In addition massage can be given to the joint and the muscles which pass over it, and passive movements until the full range of movement of the joint is established. The exercises should be performed twice a day. Thus for a knee-joint one would give knee flexion and extension (1) sitting and (2) standing. The former exercise will be chiefly for the anterior thigh muscles, and the latter for the posterior. These exercises can be increased by fixing a weight on the patient's foot. Finally, he should do exercises with his weight on the disabled limb. These exercises should be continued until the patient can hop round the room on his injured leg. These same exercises should be given to all cases in which a cartilage has been removed from the knee before the patient returns to duty. To try to redevelop the thigh muscles with massage only is perfectly hopeless, but massage may be helpful in the earlier stages when the limb aches after very little exercise.

It will be noticed that almost all these treatments end in exercises. Clayton considers this to be very important because muscles always atrophy after an injury in their neighborhood. But there is another very important reason. If a patient is given massage for a long period and is not made to make an effort himself he is very liable to develop some functional disability. To take a case, a patient who suffered from bad trench feet, and had been treated for about six months without being allowed to walk,

began to develop a talipes varus and a tremor in his legs on active movement. He was made to walk at once and do exercises on his feet to stop this functional disability. Finally, there are the cases which require no massage, but simply careful examination to find the cause for the continuation of the disability, and then some simple treatment for it.

NITROUS-OXIDE-OXYGEN, THE MOST DANGEROUS ANESTHETIC.

In the *Medical Record* of July 29, 1916, BALDWIN states that Ochsner says he made a careful test with one hundred successive cases of nitrous oxide anesthesia, compared with a similar number of ether anesthesias by the drop method, and "found no difference in the course of the anesthesia, nor in the comfort of the patient, but there was a little more bronchial irritation following operation when nitrous-oxide-oxygen gas had been used." (Absence of bronchial irritation is one of the strong claims made by those who advise this anesthetic.) The method, he says, he found cumbersome, and, therefore, permanently abandoned it. The only special value that he attributed to it is a "slight advertising value which the method undoubtedly possesses." He then speaks of the addition of oxygen to the nitrous oxide gas, and claims for it the same advertising value as for the other, but "possibly to a somewhat greater degree." He then speaks of some of the disadvantages which it has, and finally concludes as follows: "For some time there will be a certain amount of advertising advantage, but as soon as this has been dissipated through the fact that every one will be prepared to administer this form of anesthesia, its drawbacks must become apparent as compared with its advantages."

In Columbus, Ohio, nitrous-oxide-oxygen deaths have occurred at the hands of three administrators, all of whom are looked upon by their friends as thoroughly competent specialists. Deaths have occurred to each in frequency just about in proportion to the number of administrations for major operations. Dr. Rice has lost the largest number, but has undoubtedly had more administrations in major work. Dr. Howell, who has made a personal study of nitrous oxide anesthesia, and has watched many such administrations at Lakeside, Cleveland, and who has until recently used nitrous-oxide-oxygen almost exclusively, tells Baldwin that he regards Dr. Rice as the most skilled nitrous-oxide-oxygen anesthetist in the State. The anesthetist who had but one death had given this anesthesia in about fifty cases.

Baldwin is told by many that while deaths on the table are exceedingly rare from ether, many deaths occur later from pneumonia, which should be charged up to ether. Those who make these statements should certainly read Rovsing, who considers this matter briefly but very forcibly: "It is astonishing, moreover, that the misconception that ether has a harmful influence on the pulmonary passages still exists, because in reality the correctness of this view has long since been refuted, both clinically and experimentally. From a clinical point of view it was Mikulicz's report in 1898 which drove the nail home. Mikulicz, on account of the somewhat frequent occurrence of postoperative pneumonia, had deserted ether and taken up chloroform, in the belief that the pneumonia was due to the irritating effect of ether. To his surprise, however, it appeared that the cases of chloroform narcosis were followed by a still greater percentage of postoperative pneumonia. He therefore decided to give up narcosis by inhalation entirely, and thereafter employed local anesthesia in all operations, even the major ones. But, to his yet greater surprise, the result was that the lung complications, far from decreasing, increased to a considerable extent: with 114 laparotomies he had no less than twenty-seven lung complications. Naturally, this experience overthrew the old conception that postoperative cases of pneumonia were 'narcosis pneumonia.' One curious fact should long ago have aroused the surgeon's suspicions, namely, that almost every 'narcosis pneumonia' manifested itself after laparotomy, while it is extremely rare to find pneumonia following operations on

the extremities, thorax, and head. To what was this strange occurrence due? Surely, in the main, to two circumstances: (1) That peritoneal infection is conveyed to the lungs partly by way of the lymph vessels and venous blood, and partly by embolism, and (2) that a patient with a laparotomy wound dares not cough or breathe freely, inasmuch as this involves pain in the wound. If, therefore, the patient is already suffering from bronchitis, or if an infection of the lungs sets in, the development of pneumonia is greatly favored by the deficiency in expectoration and lung ventilation.

"It has been proved experimentally with animals—and I myself have substantiated the fact by experiments—that ether does, indeed, occasion increased salivation in the salivary glands of the mouth, but that the air-passages (larynx, trachea, and bronchi) are not irritated at all, even when the animals are killed by administering ether through a tracheotomy tube until they are dead. Therefore, the only way in which ether narcosis *per se* can cause pneumonia is by aspiration of accumulated saliva in the throat. This, however, is always due to some technical error in the narcosis, for saliva should not be allowed to accumulate in the throat to any extent. . . . If, therefore, it is proved that ether fumes do not in any way irritate the main air-passages, one should admit that the other assertion must also be wrong. I mean the assertion that ether is contraindicated in patients suffering from lung disease: emphysema, bronchitis, bronchiectasis, abscess of the lung, etc."

Baldwin has had ether administered in very many thousands of cases: years ago by use of the old-fashioned cone, then the Allis inhaler, and now for a number of years by some form of the drop method. He has never had a death on the table from its administration. He cannot recall a single death from postoperative pneumonia. He has had two or perhaps three deaths from suppression of the urine. It is possible, perhaps probable, that this suppression was the result of the action of the ether on the kidneys, and yet we all know that deaths from suppression occur in cases in which no anesthetic whatever has been given.

Nitrous-oxide-oxygen has a field of usefulness to which it should be strictly limited. It can be used for very brief operations, as it has been for many years in the extraction of teeth. It is also probably the safest anesthetic to use, as suggested by Ochsner, in cases of acute pulmonary congestion, or of acute nephritis. With these exceptions, which make its field a very limited one, nitrous-oxide-oxygen should be looked upon as the most dangerous anesthetic that can be used, even in the hands of the most experienced.

THE NECESSITY FOR PROLONGED TREATMENT IN CASES OF INFANTILE PARALYSIS.

HERNAMAN-JOHNSON in the *Lancet* of July 29, 1916, states that the therapeutic lessons which have been learned in connection with infantile paralysis are of special interest at the present time, as the rules to be followed are for the most part equally applicable in dealing with war injuries to nerves and muscles. The three following, at least, should always be kept in mind:

1. A muscle which is chronically overstretched cannot recover. It must be relaxed by means of a suitable splint. This principle was insisted on by Robert Jones many years ago, and its importance cannot be overemphasized.

2. When such a muscle responds moderately well to faradism—or, in more modern terms, to the small or medium capacities of the Lewis Jones instrument—its recovery will be greatly hastened (and in some cases even determined) by daily rhythmical electrical stimulation. The relaxed position must, however, be maintained throughout.

3. Exercise, whether voluntary or electrically provoked, must never be carried to the point of fatigue. The contraction of a muscle should not be less vigorous—with the same stimulus—at the end of a sitting than at its commencement. It is better that recovery should be delayed by overcaution than that it should be made impossible by excess of zeal.

THE TREATMENT OF BURNS AFTER BATTLE.

In the *Lancet* of July 8, 1916, WAKELEY states the stages of burns are: (*a*) Stage of shock; (*b*) stage of sloughing; (*c*) stage of separation of the slough; (*d*) stage of scarring. On receipt of a case of burns the immediate treatment is obviously to treat shock. Treatment can be summed up briefly —rest, warmth, and morphine; local treatment as for any other septic burn. Wakeley opens any blebs and applies picric acid; this is both antiseptic and anesthetic. If possible, instead of this he immerses the patient in a warm saline bath, especially if the body is affected. If shock is very marked, he gives a continuous saline injection with a small amount of adrenalin in it. Injection of posterior lobe of pituitary body or ergot is equally good, but acts for a short time only; strychnine and alcohol he avoids. If picric acid has been used, this is left on until shock has completely passed off. Now immediate treatment must give place to expectant treatment.

Speaking of expectant treatment naturally proposes the question, What are the complications? In the first stage shock is the all-important factor; this he has already fully dealt with. In the second stage we have to treat sepsis and prevent internal complications, such as bronchitis, diarrhea and vomiting, duodenal ulcer, etc. In the treatment of sepsis Wakeley uses chiefly hypertonic saline solution for burns of the extremities, if possible as a bath, as this serves the double purpose of keeping away air and cleansing the wound. To the face, if it is impossible to apply a continuous saline douche so as to cover completely the whole surface, he uses an oil consisting of menthol, 2 grains; eucalyptus oil, 2 minims; carron oil to the ounce. He on no account employs a dressing; the oil is applied from a bowl kept at the bedside, from which it is carried to the face on cotton-wool. This is applied at frequent intervals, the eyes at the same time being irrigated with boric lotion. At least three or four times a day the face is slightly sponged with saline so as to remove any pus which may be present and the greater part of the oil. This insures that the oil is kept fresh and that no pus is allowed to be imprisoned under scabs, which quickly form if this precaution is not taken. If this is done frequently it is the simplest matter, and even the slightest hemorrhage is avoided; and above all any little islands of epithelium from which the new skin will be produced are preserved. Wakeley has found under this treatment that a burn that has been carefully examined and found to be, say, of the third degree, will be no deeper when examined four or five days later.

He does not claim that this treatment is easy and quick; on the contrary, it requires much patience and time, but the results amply repay one. At the end of seven to ten days the wound is usually quite clean, and the epithelium is very actively growing over the granulating surface. At this stage scarlet R. ointment may be used with benefit. By this method Wakeley finds that he never gets the hemorrhage in the third or "suppurating stage," and the fourth or "scarring stage" is seldom seen with burns of the depth of those caused by shell explosion or by the flash of cordite, which have been the cause of all the burns Wakeley has had to treat. Moreover, the frequent removal of all the products of inflammation prevents the absorption of toxin or toxins, whatever it may be that causes the internal complications mentioned above. It is thus that his treatment is both immediate and expectant.

THE TREATMENT OF TUBERCULOSIS WITH CYANOCUPROL.

In the *Journal of Experimental Medicine* of August 1, 1916, OTANI states that cyanocuprol is markedly effective in tuberculosis, and he believes that it will play an important part in clinical medicine. It may be used more generally than tuberculin.

The amount of the dose is closely related to the reaction and the final results. It should be determined for each patient after a careful examination of his symptoms. The maximum dose of 8.5 Cc. should in no

case be exceeded. The shortest interval between injections should be two weeks. If the drug is given after a shorter interval no improvement is observed and the effects are sometimes dangerous.

In order to obtain the best results the patient should be placed under conditions of complete physical and mental rest after the injection; this applies even to light cases. Care should be taken to secure rest for the lesion.

During the period of the treatment irritants to the lesion, such as potassium iodide or tuberculin, should be avoided; apricot juice, guaiacol and its derivatives, and iodol are contraindicated.

No marked idiosyncrasy has been noted and no accumulative effects have been observed.

CHEMOTHERAPY OF TUBERCULOSIS.

KOGA, in the *Journal of Experimental Medicine* of August 1, 1916, reports cases treated by chemotherapy and states that a general review of the cases will, he thinks, indicate that cyanocuprol greatly improves or apparently cures pulmonary and surgical tuberculosis in the first and second stages, and that it seems also to produce beneficial effects upon the disease in the third stage. The duration of these beneficial effects is still to be established by more numerous trials and many years of observation.

The preparation must be given intravenously, and the doses must be increased or decreased according to the age and constitution of each patient. Moreover, it should be borne in mind that the pathological phenomena and constitution of each patient have much to do with the determination of the dose. The manner of action of the preparation is not yet entirely clear. But if it acts primarily upon the tissues which bear the tuberculous lesions and then indirectly against the germ, as Koga assumes at present, the activity which the tissues exert will have much to do with the efficacy of the preparation. If this hypothesis is correct, the minimum doses (10 to 12 mg.) will be best suited to a patient who is greatly emaciated, and should be gradually increased as the reactions, pathological processes, nutrition, etc., indicate. In any case, the dose of the preparation must be determined by the condition and constitution of the patient. In animal experiments Koga has been fortunate enough to obtain results which no other preparation has given. The clinical application and the establishment of its full efficacy in human cases must be left to the physician.

THE VALUE OF SCARLET RED IN THE TREATMENT OF GASTRIC AND DUODENAL ULCER.

In the *Medical Record* of July 22, 1916, FRIEDENWALD and LEITZ state that scarlet red may be administered in doses of from 15 to 20 grains, three or four times daily, without producing the slightest toxic effect, provided a pure preparation be employed. It is best given in 7½-grain cachets, two of which may be taken three or four times daily before meals. It may, however, be administered in much larger doses, and only after very large continuous doses can the odor of camphor be detected in the urine. Not the slightest toxic effect of this drug could be observed in any instance during its employment in over one hundred patients.

They report the results of treatment of thirty-seven cases of ulcer in which scarlet red was employed in the course of treatment. In the largest proportion of these cases a most beneficial effect seems to have been obtained from its use. From the use of the remedy the following conclusions were drawn:

1. Scarlet red is a useful adjuvant in the treatment of peptic ulcer.

2. While it cannot replace the usual forms of treatment, when it is administered in conjunction with them it frequently renders the cure more effective.

3. As a help in the treatment of ambulatory cases it is of great service, and its effect seems to be even more favorable than that obtained from bismuth.

4. Its use need not in any way interfere with the administration of other remedies, such as alkalies or belladonna, when indi-

cated, and, in fact, the effect of the combination is at times most beneficial.

The use of this remedy has been noted by other observers. Zeublin found it of value in a case of gastric ulcer with hemorrhage. Einhorn points out its use in gastric and duodenal ulcer, and Jones has employed it along with the duodenal tube feeding, a daily dose of scarlet red in capsule being given by mouth, along the side of the tube, with apparent good results.

Friedenwald and Leitz have since employed this remedy in forty-five more cases of ulcer with equally favorable results. As in the last report they have not included those cases in which the Leube or Lenhartz cure had been undertaken and which have made uneventful recoveries, inasmuch as most of such cases would have recovered without the help of any drug whatsoever; but have included only those in which the result of the rest cure was unsatisfactory, and have added the ambulatory cases of ulcer, which remained unbenefited by the usual treatment.

Of those cases in which the remedy was employed sixteen were treated by the Leube rest cure, eighteen by the Lenhartz treatment, and eleven were ambulatory cases. Of those treated by the Leube cure, thirteen, or 28.8 per cent, were cured; two, or 4.4 per cent, were relieved; and one, or 2.2 per cent, was not relieved. Of those treated by the Lenhartz method, fourteen, or 31.1 per cent, were cured; two, or 4.4 per cent, were relieved; and two, or 4.4 per cent, were not relieved. Of those given ambulatory treatment, four, or 8.8 per cent, were cured; four, or 8.8 per cent, were relieved; and three, or 6.6 per cent, were not cured.

When we consider the fact that all of these cases resisted the usual treatment (that is, were treated by the usual methods first and were not relieved until the scarlet red had been administered), the results obtained are most encouraging, and are much like those noted in the authors' first report.

From their experience with this remedy in the treatment of the forty-five cases of peptic ulcer just noted, together with the results in the thirty-seven cases already reported, they believe they are justified in drawing the following conclusions:

1. Scarlet red still remains a useful adjuvant in the treatment of peptic ulcer, and while it cannot by any means replace the usual forms of treatment, when administered in conjunction with them it adds materially to the effectiveness of the cure.

2. It is of great help when administered in the ambulatory cases, the effect being even more favorable than the usual remedies, such as bismuth.

3. Inasmuch as scarlet red in no way interferes with the administration of other remedies, such as the alkalies or atropine, these may be administered when indicated at the same time, and, in fact, the effect of the combination is at times most beneficial.

EPILEPSY.

In the *Journal of the American Medical Association* of July 22, 1916, DERCUM states that the first indication is that the organism, though defective and deviatory, shall lead as physiologic a life as is compatible with its structure. To attain this end, a life without physical or mental strain, close to nature, in camp or on the farm, should be adopted by the epileptic. This, indeed, is the principle applied in the various epileptic colonies. In a given number of cases it is attended by an improvement in general health and a notable diminution in the number of seizures. There can be no doubt that the benefit is largely due to the increased oxidation of waste and toxic substances and the general increase of physiologic efficiency which result from an outdoor life. In addition, three points should be borne in mind:

1. The diet should be so modified that in this organism, already toxic, as little strain as possible be placed on the liver, the thyroid, and other defensive glands. For this reason the red meats are to be partaken of sparingly. The carbohydrates also are to be diminished. To take the latter in large amount is to hamper the oxidation of the tissues, an oxidation which for the obvious reason of the autotoxicity of the patient

should be maintained at as high a level as possible. In the diet, emphasis should be laid on the white meats, the succulent vegetables, and milk; eggs also may be permitted. Stimulants of all kinds are, of course, to be excluded.

2. The various avenues of elimination should be kept freely open. If the diet does not of itself counteract the constipation frequently present, a moderate dose of a simple saline or laxative water may be given daily. The patient should drink water freely between meals to promote the action of the kidneys, and should take a lukewarm sponge bath daily to promote the action of the skin. The bath should not be such as to promote an active reaction, but merely to favor elimination.

3. Resort to medicines must, of course, be had in many cases to influence or control the seizures. Space will not permit the extended discussion of these, but after all is said and done, experience teaches that chief reliance must be placed on the bromides. Regarding their efficient administration, however, one important point must be borne in mind, namely, the principle of sodium chloride withdrawal introduced by Richet and Toulouse. If table salt is withheld, the bromides instead of being eliminated are retained and are effective in much smaller dose. Dercum, himself, has been in the habit for many years past of administering the bromides in the form of sodium bromide, at the same time instituting as rigid a withdrawal of the sodium chloride as possible. There can be no doubt that under these circumstances the sodium bromide takes the place, in a measure, of the sodium chloride in the tissues. If, in a case so treated, the sodium bromide be discontinued and sodium chloride resumed, the bromide is rapidly eliminated in the urine.

But one other point of importance remains. In a given number of instances the physiologic level of the patient may be distinctly raised by the administration from time to time of small doses of thyroid extract; say from an eighth to a quarter of a grain three times daily, seldom more. Thyroid in small doses, long continued, stimulates the chain of glands of internal secretion, increases oxidation, and promotes metabolism generally.

TREATMENT OF UNSTABLE SEMILUNAR CARTILAGES OF THE KNEE-JOINT.

WHITMAN in the *Medical Record* of July 22, 1916, points out that displacement of the internal cartilage is usually caused by external rotation of the tibia on the femur, or by internal rotation of the femur upon the fixed tibia while the knee is flexed. The sudden strain upon the internal lateral ligament, whose deeper layer is attached to the cartilage, tears the latter loose from the margin of the tibia and displaces its anterolateral portion backward toward the interior of the joint, so that it is caught between the bones when the limb is extended. The general impression seems to be that the displacement is in the other direction, and that the cartilage projects beyond the margin of the tibia, where it may be detected on palpation. This, however, must be very unusual.

In typical cases the injury occurs during violent exercise, as in athletic contests. Thus in England it is known as "footballer's knee." There is a sensation of sudden strain, and often of something slipping within the joint, usually severe pain and immediate disability, the characteristic symptom being inability to extend the limb completely. Replacement may be spontaneous, but manipulation is usually necessary. An effective method is to place the patient on the back, and to flex the knee on the thigh and the thigh on the trunk. One then abducts the tibia on the femur to separate their inner margins, then rotates the tibia outward and inward and extends the limb. During the manipulation the patient usually feels something slip, and free motion is regained. Effusion often follows the accident, and sensitiveness about the inner side of the joint persists for several weeks.

The immediate treatment after reduction should be fixation for a time sufficient for the repair of the strained or ruptured liga-

ment and reattachment of the cartilage to the tibial margin. Apparently for want of treatment, or in spite of it, such security is not often established, since recurrence is the rule under predisposing conditions. If it occurs at infrequent intervals the reaction is usually severe. If it occurs often the joint becomes more tolerant, the patient learns some effective method of readjustment, or there may be no so-called locking of the joint, the disability being rather from a sense of insecurity than from the direct consequence of the displacement. This insecurity limits activity, not only in athletic contests but under ordinary conditions as well. The patient instinctively avoids predisposing attitudes and movements, and usually knee-caps, bandages, and even apparatus are worn to assure security.

The injury is most common in young men, but it is by no means rare in young women, and although the immediate cause is injury, weak feet, weak muscles, and bad attitudes must be recognized more often as predisposing factors in this sex.

Occasionally, the consequences are more serious, when, for example, the cartilage remains displaced, so that limited motion, pain, and synovitis persist indefinitely. In these cases partial recovery is explained by disintegration of the obstruction or accommodation to its presence. In other instances the cartilage may be broken or crushed by direct violence without actual displacement, and there are others in which injury or displacement is a complication of degenerative changes in the joint.

This paper is chiefly concerned with the ordinary cases in which the symptoms are recurrent, and are directly dependent on the displacement. In this class, although complete restoration of the function of the cartilage may be possible, it is probably uncommon, the so-called cure being in most instances simply an accommodation to the weakness.

A sense of insecurity is in itself a serious handicap, while recurrent displacement endangers the function of the joint. Repeated injury to the synovial membrane which covers the cartilage leads to hypertrophy; effusion to weakness; distention to laxity of the ligaments; and the secondary muscular atrophy which is almost always present increases the functional disability. In cases of the more serious type, changes characteristic of chronic arthritis follow, which may serve as a predisposing cause of tuberculous disease.

In cases, therefore, of persistent instability, in which the inconvenience is at all serious, particularly if a bandage or other support must be worn constantly, removal of the cartilage is indicated.

The operation would be advisable even if the cartilage were essential to normal function, since if it is loose it is practically a foreign body. It is not, however, thus essential. Experimentally, its removal does not affect the movements of the joint, nor is function impaired in those cases that have been operated on.

It is true that stability may be assured in most instances by a brace that prevents lateral mobility, but the treatment is somewhat burdensome, the outcome uncertain, and, if successful, the result no better than that which is practically assured by the removal of the unstable cartilage.

What may be classed as relatively early operative treatment is, Whitman finds, not usually advised or approved either by physicians or surgeons. The operation is thought to be dangerous, requiring prolonged convalescence, and resulting in a weakened or possibly stiffened joint. From practical experience, however, it may be stated that the immediate discomfort and the succeeding disability are usually no greater, and often are less, than when caused by the occasional displacement. In fact, functional recovery is far more often delayed by relaxed ligaments, atrophied muscles, and hypertrophied synovial membrane—the results of persistent irritation and injury—than by the operative removal of the cause.

The only reasonable argument for delay when the diagnosis is clear and the disability recurrent is the danger of infection, and this may be reduced to the most remote possibility by the simplicity and directness

of the operative procedure. In favorable cases the cartilage may be removed in a few minutes. There is no necessity for exploration of the joint, and the only assistance required is for retraction of the tissues.

Particular attention is, of course, paid to cleanliness. If time permits the part may be shaved, washed, and protected by gauze for several days before the operation, when it is prepared with iodine in the usual manner. An Esmarch bandage is usually applied in order to avoid swabbing and the like. The patient is then drawn down to the edge of the table, so that the leg, flexed to a right angle at the knee, hangs dependent, as suggested by Jones. In this attitude an incision, slightly convex forward, is made midway between the border of the patella and the condyle, its base being just in front of the internal lateral ligament. The joint is then opened. In most instances the displacement of the cartilage is evident, since the tension on the capsule of the dependent leg draws it upward and away from the table. Not infrequently it is detached anteriorly and displaced backward. It may be fractured, or thickened and pedunculated, but in the ordinary case it is not greatly changed in shape. It may be normal in appearance or yellowish in color if the disability is of long standing. By extending the incision downward the cartilage may be divided into two parts; the anterior or free half is then easily detached by a slight pull with the forceps. The posterior part is attached to the capsule, and often to the tibia, and must be separated with the scissors. It is the rule, apparently, to cut away only the loose anterior portion, but Whitman has always removed the entire cartilage, and thus a possible cause of further trouble. In most instances the evidences of previous irritation and injury may be seen in congestion of the tissues, and particularly in the hypertrophy of the synovial membrane.

After removal of the cartilage the synovial membrane is closed with fine catgut, and the capsule and other tissues in layers with stronger sutures. No drainage is used. The knee is firmly bound with a gauze roller, and a light plaster splint holding the limb in slight flexion is applied. Apparently the bleeding after suturing is insignificant, since no inconvenience has been noted from this source. The plaster splint is of service in lessening the discomfort caused by sudden movements during the sensitive stage. The patient usually remains in the hospital for a week, though not necessarily in bed, activity being regulated by the sensations.

The plaster splint is retained for about two weeks, in order to permit of repair of the capsule. The knee is then strapped to replace the support, and to guard against strain.

The patient is instructed to cultivate an elastic gait in walking. If, as is often the case, there is a tendency toward valgus, the soles are thickened on the inner border, or arch supports are applied if the deformity is more marked, and appropriate exercises are prescribed.

In cases of a favorable type cure is practically complete in a few weeks. In those of long standing, in which the muscles are atrophied, the ligaments relaxed, and the internal structure of the joint disorganized, recovery is slower, and a supporting apparatus may be indicated, but the improvement is immediately apparent and progressive and the result is satisfactory to the patient.

INDUSTRIAL ANILINE POISONING.

The *Lancet* of July 15, 1916, tells us that apart from the production of aniline colors, aniline is used in America in the compounding of rubber, especially for tires, and in reclaiming rubber from scrap. When the war suddenly shut off the supply from Germany rubber manufacturers began to manufacture aniline, so that now to the man exposed to anilism in rubber manufacture must be added those engaged in producing the aniline. Industrial aniline poisoning, which a few years ago was negligible, has suddenly assumed importance.

So far the making of dyes is too new in the United States to furnish cases; those reported come from the rubber industry and from the use of a wash for printers'

ink which contains aniline. The victims are known as "blue boys," from the cyanosis which is so prominent a symptom. Since the discovery of the cause of the trouble the rubber manufacturers have taken measures of protection, either by installing exhaust ventilators or simply by warning the men to seek the open air as soon as flushing of the face and violent headache come on. Pure aniline has never been known to cause poisoning; but pure aniline is not used in industry. What is known under this name is a mixture of aniline (amidobenzene) with metatoluidin, paratoluidin, or orthotoluidin, and xylidin in varying proportions.

Unlike most volatile poisons, aniline gives no warning, for it does not irritate the eyes and throat. Yet according to the researches of Lehmann, aniline is toxic in even smaller doses than benzene, chloroform, or carbon disulphide. Most of the industrial cases follow spilling or splashing of aniline over clothes or skin, and doubtless both skin absorption and lung absorption play their part. Rambousek places aniline and all the nitro and amido derivatives of the aromatic series among the blood poisons, the principal action of which is to cause the formation of methemoglobin, in which the oxygen is firmly bound, thus producing a condition of "internal suffocation."

In England Dr. W. Malden has examined the blood of men employed in the manufacture of aniline dyes and nitrobenzene. In about half he found a high red count with a low color index and many imperfectly developed red corpuscles. The spectrum of methemoglobin could be detected only when it was present in the proportion of 1 part to 10 of oxyhemoglobin. Loss of hemoglobin ran from 5 to 50 per cent. Stained specimens showed great variations in the size of the red corpuscles. Basophilic granules were found. Dr. Malden believes that this is often the earliest sign of aniline poisoning, as it is of lead poisoning. The first symptoms are weariness or sleepiness, flushing of the face, a sense of fulness in the head, and even of slight mental confusion, dryness of the throat, and dysphagia. The color of the face changes from red to livid blue, which may increase to a deep purple. The pulse is rapid and weak, the temperature subnormal. Headache comes on early and is often violent, accompanied by dizziness and nausea, and in the more serious cases there is decided dyspnea, increasing mental confusion, and finally loss of consciousness. These symptoms are due to want of oxygen. Later symptoms—icterus, methemoglobinuria, bladder irritation, and bronchitis—are caused by the elimination of the poison. In some cases the subjective symptoms are slight, and the man seeks advice because of his livid or blue color, which is alarming to him and his friends. Usually industrial cases do not exhibit the severest symptoms, but epileptoid convulsions and protracted coma have occurred and proved puzzling to the medical attendant.

Recovery in the milder cases is prompt, the men usually returning to work on the following day, though the cyanosis often persists for several days more. Chronic anilism is described by von Jaksch as a condition resulting from repeated doses of the poison so small as not to set up symptoms of acute poisoning. There is more or less headache, nausea, vertigo, muscular twitchings, disturbances of vision, sense of exhaustion, and loss of strength. The skin is usually livid, or it may be jaundiced. In one case the man was treated for heart disease because of his cyanotic appearance and dyspnea on exertion.

CONTRAINDICATIONS IN THE PNEUMOTHORAX TREATMENT OF PULMONARY TUBERCLE.

RIVIERE in the *Lancet* of July 15, 1916, states that disease of other organs, whether tubercular or not, may contraindicate the production of an artificial pneumothorax.

Advanced emphysema and asthma are contraindications. Dyspnea is in itself no contraindication, since it is in many cases toxic in origin and is relieved by the removal of autoinoculation.

Pneumothorax therapy may reduce the pulmonary vascular area, in some cases at least, and thus put a strain on the right heart. In addition, the loss or reduction of intrathoracic suction tends to embarrass the venous circulation. The effect of these disabilities on circulatory organs and kidneys renders any serious disease of these organs a contraindication to pneumothorax therapy. On the other hand, it must be noted that certain cases of nephritis appear to be of tuberculotoxic origin, and have been known to recover when autoinoculation was removed.

Laryngeal tuberculosis is no contraindication, unless very advanced, and then a doubtful one. Da Gradi has described three bad cases from Forlanini's clinic improved or healed. Slighter cases of laryngeal disease commonly improve; among 11 such cases mentioned by Zink all recovered except one very bad one, and that one improved very decidedly.

Intestinal tuberculosis is a contraindication, unless slight and consequently latent. Brauer and Spengler, however, record two cases in which intestinal disease led to symptoms, and in which these disappeared under pneumothorax treatment.

Diabetes is a complication which should make the physician very chary of recommending pneumothorax treatment.

In conclusion it may be stated briefly that pneumothorax should be borne in mind in all cases in which life is "threatened," but it must not be postponed till life is "in danger," for it is mostly then too late. "The higher function of pneumothorax therapy," says Weiss, "is this—to restore lost cases to health;" but the bad outlook must be recognized in good time if pneumothorax treatment is to succeed. A phthisis case may be to the initiated "lost," so far as ordinary methods of treatment are of avail, long before the end is in sight. It is at this stage, or even before, that the suitability of pneumothorax treatment must be decided upon if a clear other lung, absence of widespread adhesions, and a reëxpansible lung are to be with any likelihood attained. On the other hand, it must be admitted that the advanced, apparently unilateral, hilus tuberculosis cases are seldom met too late for this treatment, and it is remarkable how often the pleura remains sufficiently unadherent to allow the production of an efficient pneumothorax over disease extending even from apex to base.

THE SIGNIFICANCE OF THE AMINO-ACIDS.

The *Lancet* of July 8, 1916, points out that the interesting group of bodies known as the amino-acids is disclosing facts of the utmost importance in connection with nutrition. It is well known that on hydrolysis proteins break down by resolution of the polypeptide linkings in the molecule into an assembly of *a*-amino-acids, of which some 18 have been separated. Inquiry is now being developed in directions which show that each of these substances possesses its own significance—sometimes greater, sometimes less—in the processes of nutrition. Inasmuch as the proteins do not all alike resolve into the same amino-acids, it is clear that their metabolic value will depend upon the kind of amino-acid produced.

In an interesting and lucid lecture upon the subject delivered before the Chemical Society on May 18 by Dr. F. Gowland Hopkins, and now published in the June number of the society's journal, these "newer standpoints in the study of nutrition"—the title of the lecture—are carefully discussed. The starting-point of this study is that when a mixture of all the free amino-acids obtainable from protein has entirely replaced the normal intact protein of their food, an adult animal maintains itself and a young animal grows. In his own experience Dr. Hopkins records that scores of young animals grow steadily during experimental periods when no trace of intact protein, and no other source of flesh-forming material save amino-acids, was passing their mouths.

In a brief and excellent outline of the salient features of the problem Dr. Frank P. Underhill, professor of pathological chemistry, Yale University, makes similar observations. His conclusion is that the

amino-acids must be regarded as foodstuffs capable of supplying the nitrogenous needs of the organism, and that the chief factors to be taken into account with regard to the nutritive value of any protein or proteins are the character and the extent of the amino-acids contained therein. Since it is mainly, if not entirely, in the form of free amino-acids, and not in complex associations of these, that our nitrogenous food begins its proper metabolism, it is obviously valuable to be able to measure the relative nutritive importance of the different molecular groups in the protein molecule. We could then determine, as Dr. Hopkins points out, whether in any particular case the withdrawal of individual amino-acids deprives the animal of something essential, or whether, perhaps, the removal from the food of any particular amino-acid under study may have little effect, because the animal can synthesize it for itself or dispense with it altogether. We may thus gain a further insight into the question of deficiency diseases. It should be pointed out, however, that during the use of the synthetic diets suggested as a basis of inquiry, Dr. Hopkins has found that it is always essential to supply the "at present mysterious vitamine of food hormone factor."

The results of the experiments are very remarkable. Thus when an animal is fed on food containing only tryptophan, histidine, tyrosine, lysine, and cystine—that is, five out of the eighteen amino-acids of protein—there is a remarkably slow loss of weight, and long maintenance of apparent health. On the other hand, when the five amino-acids mentioned are replaced by another five of simpler aliphatic type, when leucine, valine, alanine, and glycine, together with glutamic acid, form the sole nitrogen supply, loss of weight is rapid and the animal soon succumbs. A familiar case of a non-nutritional protein is gelatin, and, significantly enough, this substance on hydrolysis yields neither tyrosine nor tryptophan. The entire absence of tryptophan from its molecule stamps it at once, says Dr. Hopkins, as a deficient foodstuff. Dr. Hopkins goes even so far as to say that he feels it quite possible that further experiment will show that life can be maintained on a mixture from which many of the amino-acids are lacking. This suggests that if nutrition can be guaranteed on a quite limited number of amino-acids, the solution of the problem of artificially synthesizing our food-supply is brought within the region of possibility. On all fours with this are the independent conclusions of Professor Underhill in the work already referred to. Investigations of this character promise ultimately, he suggests, to lead to the assignment of more or less specific functions to the various amino-acids, and hence will indirectly indicate the relative efficiency of this or that protein in bringing about a desired result in nutrition. The whole story is a triumph of biochemical research.

TUBAL STERILIZATION.

HEINEBERG in the *New York Medical Journal* of July 15, 1916, contributes a useful paper on this subject. From his résumé of the clinical and experimental experience with tubal sterilization, he believes that we may fairly arrive at the following conclusions:

1. There is no method of tubal sterilization which affords absolute security against conception.

2. Simple ligation of Fallopian tubes with either single or double ligatures has been followed by the largest number of reported failures.

3. Excision of a wedge-shaped section from each cornu of the uterus, followed by careful closure of the opening with musculomuscular and seroserous sutures, has yielded better results than any other method.

4. In the light of our present knowledge it seems unwise to advocate any other method than cornual resection. These conclusions are in accord with those arrived at in previous reviews of this subject by Charles, Geissler, Günther, Mironow, Offergeld, Perdrizet, Pestalozza, and Sarwey.

EXPERIENCE WITH HOMOGENIZED OLIVE OIL MIXTURES.

LADD in the *Archives of Pediatrics* for July, 1916, states that the principal differences in the fats of cow's milk and human milk are the size of the fat globules and the proportion of volatile fatty acids. The proportion of volatile fatty acids in breast milk is 2.5 per cent of the total fat; in cow's milk 27.0 per cent of the total fat. The non-volatile fats are made up mostly of olein and palmitin in both cow's milk and breast milk. Olive oil is almost wholly olein and palmitin, and free from the volatile fatty acids which form such a large proportion of cow's milk fat. It was Ladd's suggestion, therefore, to utilize olive oil to obtain the fat percentage in modified milk mixtures and so to eliminate the volatile fatty acids; and also by homogenization to secure an emulsion as fine or finer than that of human milk. The milk-sugar and proteins were to be obtained from skimmed milk as usual, and additional carbohydrates, in the form of dextri-maltose and starch, prescribed according to the usual indications.

This method of feeding has been applied to 37 cases, of which 12 occurred in private practice and 25 in the out-patient department of the Children's Hospital. The present series includes the subsequent histories of the cases reported last year. Ladd has not included in this list the older children, whose diet was from the start a mixed one, and which would, therefore, come into another class. He has also excluded one private case of congenital heart disease and enlarged thymus, two or three hospital cases which had the milk for a few days only, and a few which have been recently started. The series as tabulated includes practically all of the cases of difficult feeding that he has had an opportunity to study.

It should be borne in mind that the hospital cases which he has used were babies which had been under treatment for malnutrition and indigestion for considerable periods without making satisfactory progress in their weight development under the usual methods of feeding. The average length of this period of out-patient feeding in this series, before beginning the homogenized olive oil mixtures, was three months. The result of previous feedings is best appreciated when one understands that the average number of months was 6.3, with an average gain of only 5 ounces per month.

Naturally in such a series all types and degrees of indigestion were met with. It is not difficult to modify milk in such a way that fairly normal movements and freedom from discomfort are obtained, but the failure of the feeding is shown by the lack of normal weight development—and by digestive disturbances brought about when the attempt is made to raise the fats to such a point that normal gains in weight should be expected.

A normal, healthy baby gains, according to a high standard of growth, 14 pounds in twelve months, or an average of 18.7 ounces per month.

In Ladd's series of 37 cases, whose average gain on previous feedings was 5 ounces per month, for a period of 6.3 months, the average gain per month was 18.15 ounces, or within one-half ounce per month of the normal healthy infant. This represents a gain of three and one-half times (363 per cent) over that of the previous feeding. The average period of the homogenized olive oil feeding was 4.7 months, a sufficient time to determine its permanent effects.

The improvement in the babies' general condition has been as striking as that of their gain in weight. Vomiting and sour regurgitation, when present as symptoms, are quickly relieved. The child improves in strength, in the quality of its fat, and in the development of its functions, as one expects it to do in normal successful feeding. The appetite improves rapidly, and the stools soon become normal in appearance, if the sugars are intelligently prescribed. By this he refers to proper proportions of dextrin and maltose. When there is a tendency to looseness, he has used the preparation known as "dextri-maltose" for the extra carbohydrates; on the other hand, when the bowels are constipated, the

usual laboratory "maltose," or malt soup preparations, are preferable. In many cases a combination of the two will bring about a normal stool if used in proportions suited to the individual child. Barley water (0.75 per cent) was used in nearly every case. In some cases the mixture was treated to 212° F., in others given unheated. Lime water was usually given in amounts of 5 to 10 per cent of the total mixture, but not as a matter of routine.

The percentage of olive oil was almost invariably started at 1.50 and did not exceed 3.50 per cent. The indication for raising this was the rate of gain and sense of hunger. The total carbohydrate was usually started at about 5 per cent and never exceeded 7 per cent. The proteins were started at 1.50 per cent and seldom exceeded 2 per cent. In Ladd's opinion hunger is the safest guide as to the child's tolerance for the amount of fat it is taking. If the appetite remains keen, the olive oil is being well taken care of.

CREOLIN IN SCABIES IN THE INFANT.

In the *Archives of Pediatrics* for July, 1916, MONTGOMERY says his first acquaintance with the good qualities of creolin came about almost by accident. Some years ago, while passing through Dresden, he called on J. Werther, who invited Montgomery to see his clinic in the city hospital. While viewing a patient with scabies, Dr. Werther rather pointedly remarked that creolin was of decided value in this disease, and on Montgomery's further inquiry Werther gave him the following prescription:

℞ Creolin, 10.00;
Sapo. viridis, 30.00;
Adipis benzoati, q. s. ad. 100.00.
M. Sig.: Rub in once a day.

The green soap adds to the penetrating qualities of the preparation, but it is not a necessary ingredient, and may be undesirable as drying and irritating to the tender infant skin.

Creolin owes its effectiveness to the presence of trikresol. These three cresols are the isomeric methylated benzine alcohols that occur associated with phenol in coal tar and in creosote. In fact, the name cresol is an abbreviation of creos-ol, meaning the alcohol of creosote. The cresols are very widely distributed in nature. Two of them, para- and ortho-methylated oxybenzol, occur in the urine. It is doubtful if meta-cresol has ever been found there. The three cresols, ortho-, meta-, and para-cresol, are by no means of equal value as antiseptics, as meta-cresol is by far more powerful than either of the other two. Pure trikresol is a clear, oily liquid, soluble in water to the extent of 2 per cent, and very slowly diffusible. If, for instance, pure trikresol is dropped into water it instantly sinks to the bottom of the glass, where it rests as a beautiful, clear, egg-shaped mass. The preparation called creolin, however, when dropped into water quickly diffuses, making a milky mixture, which may be highly diluted and yet retain its insecticidal quality. It is this that renders creolin so cheap in the commercial uses to which it is put in destroying mosquito larvæ and the insects that infest chicken-coops.

PREGNANCY TOXEMIA.

WILLIAMSON in *American Medicine* for June, 1916, reaches these conclusions:

1. In cases of pregnancy toxemia chloroform should never be administered, because the action of chloroform is to render more grave the lesions which already exist and increase the acidosis. Ether administered by the open method is in every way preferable as an anesthetic.

2. Calomel should not be used as an aperient, for the lesions in the liver and kidneys produced by mercurial poisoning are of the same nature as those of pregnancy toxemia, and it is probable that mercury even in small doses will increase the gravity of the lesions already existing.

3. For a similar reason douches of mercurial antiseptics should never be employed.

4. In all cases in which acidosis is pres-

ent intravenous infusion with a solution of sodium bicarbonate or sodium acetate should be practiced.

5. The fat metabolism should be spared as far as possible by the administration of glucose. Williamson's practice has been to administer it by the rectum when vomiting is present, and to give it by the mouth in the form of glucose lemonade where the digestive functions are not deranged.

6. When a pregnant woman suffering from chronic nephritis shows evidence of the existence of acidosis, the uterine contents should be evacuated without delay, for with kidneys previously damaged the prognosis of pregnancy toxemia is very grave.

THE TREATMENT OF PARALYSIS AGITANS WITH PARATHYROID GLAND.

In the *Medical Record* of July 15, 1916, BERKELEY states that further experience seems fully to justify the opinion he has formerly expressed, namely, that parathyroid gland is not a "cure" for paralysis agitans, but that 60 to 70 per cent of the sufferers from this dreadful disease who have given the remedy a fair trial for from three to six months (it takes all of this time to test it) have been greatly benefited, and that in such patients the progress of the disease has been arrested, or very materially retarded.

One patient, an elderly man, has taken the capsules for seven years (also the hypodermic solution at times), and he is still in fairly good condition, but lapses into helplessness within a few days when the medicine is omitted.

Another recent case, a woman, fifty-two years old, has done wonderfully well. Her agitation has been entirely arrested, and her rigidity greatly relieved. She had suffered with the disease for two years before Berkeley saw her, and had spent all of her money on osteopathic and electrical treatments; so that, if suggestion had anything to do with her case, she certainly had ample opportunity for full exercise of her imagination before undertaking the parathyroid medication.

There are no other internal secretions which have any specifically beneficial effect whatever—either alone or in combination—in paralysis agitans. Among the older patients pineal gland is a useful stimulant to functionally failing mental activity, and there is now on the market one extract of pancreas which is valuable in the peculiarly obstinate constipation these patients are afflicted with. But Berkeley cannot too strongly deprecate promiscuous dosing with thyroid, and pituitary, and others of the internal glands. Thyroid, especially, does serious harm; even massage of the neck over the thyroid gland sometimes liberates enough of the thyroid secretion to make the patient distinctly uncomfortable.

Like most chronic diseases, paralysis agitans does not do well in institutions, for reasons which are sufficiently obvious. The most successful cases have been in private practice, where cheerful surroundings, occasional opportunities for travel, and a varied diet contribute to the patient's comfort, and increase his resisting power. But a fair proportion even of the almshouse poor have been greatly helped.

Berkeley is still of the opinion, as he has long been, that paralysis agitans is caused by a deficiency of the parathyroid glands, and that further and more diligent study of the complicated chemical processes involved will make it ultimately possible to cure paralysis agitans with parathyroid in just the same way in which cretinism is cured with thyroid.

THE VALUE OF EUDRENINE IN MINOR OPERATIVE SURGERY.

In *The Prescriber* of Edinburgh for July, 1916, ALLAN reminds us that the administration of a general anesthetic is never quite devoid of danger, even in the hands of the most skilled anesthetist; and further, unpleasant after-effects cannot be altogether eliminated, although these can be reduced to a minimum by the careful preparation of the patient and by the skilled exhibition of the anesthetic employed, both during the induction of and during the

maintenance of anesthesia. While the majority of major operations necessitate the use of a general anesthetic, many minor surgical conditions can be operated on under local anesthesia. Allan has made use of many local anesthetics, and he would like to make a few remarks on eudrenine, which he has employed with very successful results. Eudrenine consists of benzamine (beta-eucaine) hydrochloride (one per cent), associated with adrenalin chloride (1 to 30,000), in physiological salt solution, and it is preserved with chloretone. Each Cc. (16.9 minims) contains benzamine hydrochloride (grain 1/6) and adrenalin chloride (grain 1/2000).

The technique is very similar to that of most other local anesthetics, and need not be detailed. It will suffice to say that the injection is made with an ordinary hypodermic syringe, and the solution is slowly injected into the area to be operated upon. This should of course be done with aseptic precautions, and so far as the patient is concerned, painting the operation area with iodine is generally all that is required. For the majority of small operations it is seldom necessary to inject more than 1 Cc., and in some cases a smaller quantity will suffice. If a larger area has to be anesthetized and more of the solution is required, it is advisable to dilute the solution with some normal saline, say 1 part of eudrenine to 3 or 4 parts of physiological sodium chloride solution. This tends to minimize the risk of toxic symptoms supervening or of untoward local effects resulting. Care should be taken to allow sufficient time to elapse before commencing the operation, otherwise the results may be disappointing. The time for the production of efficient anesthesia is not very long, and in the majority of cases varies from five to ten minutes. In addition to this excellent local anesthetic effect, the injection of eudrenine renders the area of the operation practically bloodless, and so greatly facilitates quick operative work. The effect, however, is not so transient that one need hurry over the operation, for Allan has found that where speedy operation was not possible the anesthetic action has been maintained for a considerable time. It would appear that the addition of adrenalin chloride to the beta-eucaine enhances and intensifies the local analgesic effect of the latter.

Allan says something regarding some of the cases in which he has employed it. In searching for portions of needles in the hand, etc., it is generally necessary to employ a local anesthetic, for those who have had experience of such cases know that the search may take some time, even when the foreign body has been located with the *x*-rays. In one case of this nature a search for a portion of needle in the hand was made before a radiograph had been taken, but without result. The hand was then photographed, the needle located, and after some little trouble it was extracted. The delay thus caused was considerable, and it was almost two hours after the injection before the needle was ultimately removed. Yet the anesthetic effect had evidently not passed off, and it was only when one cut into the deeper parts, to which the solution had probably not reached, that the patient complained of a little pain.

Another class of foreign bodies in the tissue, namely, bullets and pieces of shell, can be extracted under local anesthesia, provided these are not too deeply situated, and Allan has successfully dealt with several cases of this kind. In the removal of small tumors and cysts eudrenine is very useful, and of cases in this category in which he has employed it may be mentioned papilloma of the thigh, warty growth on ankle, sebaceous and dermoid cysts, lipoma of neck, nevus of arm, etc.

Eudrenine is also useful in ophthalmic work. The anesthetizing effect of cocaine instilled into the eye by drops is comparatively superficial, and in the case of squint operations, where one or other of the eye muscles has to be advanced, the injection of a little eudrenine or other solution into the deeper parts is necessary if the operation is to be carried out without pain. In various small plastic operations it may be utilized, and other conditions in the realms

of minor operative work will readily occur to one as cases in which this local anesthetic may be beneficially employed.

In Allan's experience eudrenine has proved to be a reliable local anesthetic. Its analgesic action has been almost perfect, and there has been very little bleeding (in some the operation area has been quite bloodless) in cases in which it has been used, two very important factors of recommendation for any local anesthetic. Allan has seen no toxic symptoms supervene after its use, and after-effects locally have been conspicuous by their absence. All his cases which were aseptic to start with have healed by primary union. Eudrenine is not nearly so effective in the presence of inflammatory trouble; indeed, in some of these cases it appears to have no effect at all. Apart from that it is a safe and reliable local anesthetic, and may be recommended with confidence for numerous cases such as he has indicated above. It is well to know that many small operations can be successfully performed under a local anesthetic without the help of a brother practitioner.

DIABETIC ACIDOSIS.

In *American Medicine* for June, 1916, CROFTAN states that the prevention of acidosis in the milder grades of diabetes is not a difficult problem, provided routine proteid-fat feeding is not adopted without control. With an amount of carbohydrate administered within the limits of established tolerance, together with sufficient fixed alkali in the form of soda bicarbonate to protect the tissue alkalies, acidosis can usually be prevented or held within safe bounds indefinitely, while at the same time the patient's general nutrition and strength can be comfortably maintained.

In the more severe types of diabetes, viz., that class in which carbohydrate tolerance, even for a single carbohydrate (oatmeal cures), is low or *nil* and in which some reduction of proteid must be practiced to cause a disappearance of the glycosuria, one can adopt one of two plans: either inaugurate a short starvation period, determine the tolerance of proteid and carbohydrate, permanently reduce the patient's weight, *i.e.*, total caloric requirements, carefully establish the fat effect, and then feed accordingly, with soda, thus keeping the patient undernourished but free from glycosuria and ketonuria; or, more practically, several recent writers of an academic bias, to the contrary notwithstanding, permit a mild glycosuria within controlled bounds by giving proteid and carbohydrate slightly above the established tolerance limits, with little fat, abundant soda and alcohol, thus maintaining in a much more adequate and, to the patient, more satisfactory and equally safe way nutrition, strength, and enjoyment of life.

Personally, Croftan cannot from his experience subscribe to the newer dictum that every diabetic should be kept permanently sugar-free, if necessary to accomplish this, thin, and, in any event, undernourished. If one could keep these patients permanently or, at least, for months in an institution this plan might be of advantage, but from the standpoint of the physician in actual practice, and from the standpoint of the vast majority of patients, the full nutrition plan, with controlled glycosuria, is more feasible and, above all things, more human.

In the very severe types of diabetes, and to this group belong most of the childhood and adolescent types, one is usually confronted with a desperate and, as far as the end result is concerned, a hopeless situation. Here no sacrifice is too great and the principle of rest to the deeply disordered metabolic function must be carried out to its utmost limit. Strict individualization as to tolerance is required. A short cut to these studies is the starvation plan. Instead of consuming weeks to practice slow proteid starvation, one can apparently arrive at the same goal more quickly and apparently as safely and without the use of soda by a fasting period, preferably preceded by a short term of proteid starvation. Personally, Croftan has learned to combine the starvation with the administration of pancreatized oatmeal by rectum as an equally rapid and less weakening process.

The effect of fasting on acidosis varies in these cases; the element of idiosyncrasy is pronounced, and it is important to individualize. One can never predict in advance just what will occur, so that this form of treatment, to render it safe, should remain an institution method, carried out under the most accurate control and with all emergency measures at hand. Croftan rather dreads the effect of the coma mortality and the popularization of this precarious method will have, when administered as a routine. Most alarming degrees of acidosis do unquestionably appear, and carbohydrate must occasionally be given to save life; if the patient survives, a second fasting attempt may be, and often is, more successful.

Croftan's experience so far has taught him that, even after taking the risk and imposing the sacrifice of a fasting course in very severe types of diabetes, the good immediate results, even in the most favorable cases, are not followed, after the patient is dismissed from personal observation and control, by end results materially better or more permanent than those obtained by the slower but safer and less irksome process of slow proteid starvation.

The subject of acidosis remains obscure, paradoxical, bizarre, uncertain. Newer methods may stabilize our conceptions and clear our understanding. That an acid intoxication can produce air hunger, Kussmaul breathing, vomiting, convulsions, delirium, and coma is established, but whether the fulminating picture of diabetic coma is always due to such an acidosis remains problematical. The metabolic derangement is so extreme, the degradation of the proteids and fats so abnormal, that any one of numberless intermediary products of catabolism, the existence of which we may not even suspect, might be incriminated with causing coma; Croftan has never been able to suppress the conviction that highly toxic products of proteid disintegration, still albuminoid in character, play a part. When we remember that the nearer the albuminoid degradation products approximate the original molecule the more toxic they remain, when we recall the supertoxic properties of toxalbumins, ptomatoxins, and of all that group, one is strongly tempted to postulate that, even in minute quantities, they can produce the tragic picture of coma.

ADRENALIN PER OS FOR ABDOMINAL PAIN.

Boogher (*New York Medical Journal*, July 8, 1916), having recently suffered with an abscess of the transverse colon, it was suggested to him, after twenty-four hours of excruciating pain, by Dr. George Richter, of St. Louis, that he try fifteen drops of adrenalin in one tablespoonful of water as often as required, for the relief of this pain.

Fearing to take morphine because of its muscular fixation powers and its after-effects, Boogher gladly welcomed the suggestion, as adrenalin had been used in Vienna in the surgical wards with splendid results, the patients themselves asking for the "good drops" on the approach of abdominal pain.

At the suggestion of Dr. C. A. L. Reed, of Cincinnati, Boogher told Dr. Andrews, chairman of the surgical section of the A. M. A.; he requested Boogher to take two minutes of the afternoon session which was held conjointly with the internal medical section at the Detroit meeting of the American Medical Association.

Boogher has suggested it in a gall-stone case and used it in kidney colic, in both of which cases it gave splendid relief.

He considers it a panacea in all cases of abdominal pain.

In fifteen-drop doses in a tablespoonful of water it can be given as often as required internally, its action being different when administered hypodermically.

He believes adrenalin could be used as a substitute for twilight sleep.

This letter is doubly interesting, first, on account of the announcement of the discovery of analgesic properties in adrenalin, and second, because the product has always been considered inert when administered per os. Even the manufacturers insist that suprarenal preparations must be given hypodermically in order to produce either a physiological or a therapeutic effect.

DANGER OF BATHS IN PATIENTS SUFFERING FROM ARTERIOSCLEROSIS.

In the *California State Journal of Medicine* for July, 1916, KERR states that most hydrotherapists have agreed that the changes in blood-pressure depend upon the temperature of the water much more than upon any action of the salts in solution, yet there cannot be any doubt that these have some influence, although our knowledge on this point goes very little beyond the general statement that the salts, especially the chlorides, by process of endosmosis, reach the upper layers of the cutis, to which they attract water from the deeper tissues. This abstraction of water stimulates the terminations of the cutaneous nerves, and, reflexly, the cardiac and vasomotor centers. There is no absorption of salts through the skin into the circulation. Much greater importance is attached to the presence of carbon dioxide. This has been worked out especially in relation to the Nauheim baths, and Mueller has found that in the artificial Nauheim baths, while the pressure depends more upon the temperature of the water than upon the carbon dioxide present, on the other hand these two factors participate almost equally in the production of changes in the pulse-rate.

At one time it was believed and taught that the carbon dioxide produced a prolonged dilatation of the peripheral vessels, and therefore a lowering of pressure and lightening of the heart's work. This, however, is erroneous, and it has been shown that in the cool Nauheim bath there is a rise in pressure due to contraction of the peripheral vessels which is not compensated by the splanchnic vessels, although these dilate to a considerable extent; that the ventricular output is increased, and that there is a greater and more rapid flow of blood through the peripheral vessels producing a pink color of the skin. As the pulse-rate is slowed the increased output must be due to a more complete systole diminishing the amount of residual blood usually remaining in the ventricle, for it must be remembered that normally the ventricle does not empty itself with each contraction, but that, in such animals as the dog, with a pulse-rate of 90, about one-third of the ventricular contents remains after each systole. The effect of the Nauheim baths is supposed to be due to the fact that carbon dioxide, accumulated on the body surface, retards the conduction of heat from the body to the water, and thus prevents the rapid cooling that takes place in plain water. In the carbon dioxide bath the peripheral nerves receive the usual stimulation from the application of cold, but the body temperature being longer maintained the result is as if the patient had a cold and warm bath simultaneously.

It is evident that the Nauheim bath by simultaneously contracting the peripheral vessels and increasing the cardiac output produces increased work for the heart, that the temperature and amount of carbon dioxide being capable of regulation, the amount of this work can be graduated to the heart's capabilities, and finally that the adaptability of cases to the treatment will depend on the responsive power of the myocardium, rather than on the nature of the lesion. For the same reason it may be expected that such cases of arteriosclerosis, kidney involvement, or high blood-pressure as are deemed suitable to hydrotherapeutic measures will frequently do better in the saline baths at a temperature of 94° F. to 96° F., than in those containing carbon dioxide, and at either a higher or lower temperature.

In conclusion, the writer emphasizes the fact that warm baths may be dangerous to patients suffering from arteriosclerosis, because the higher temperature tends to increase the heart load by causing a slight rise in the systolic pressure but a marked fall in the diastolic, which together with the acceleration of the pulse-rate may result in serious augmentation of the strain upon the heart muscle.

In giving baths, therefore, the attendant must note the diastolic as well as the systolic pressure, and figure out the heart load, and not content himself by observing that the systolic pressure is not very much increased.

RECENT PROGRESS IN OUR KNOWLEDGE OF THE PHYSIOLOGICAL ACTION OF ATMOSPHERIC CONDITIONS.

This important subject is discussed by LEE in the *American Journal of Obstetrics* for July, 1916. He states that in the physiological laboratory of the Columbia School of Medicine, Dr. Eastman and he made experiments the results of which have changed their ideas concerning the physiological action of atmospheric conditions. It had long been the custom to ascribe to chemical components of the atmosphere the bad effects of living in air that had already been breathed by human beings. The discovery of oxygen and carbon dioxide early in the last century gave a great stimulus to this notion, and it became firmly fixed in the minds of chemists, physiologists, and physicians, as well as the educated masses, that air that had once been breathed was chemically vitiated and rendered unfit for human use by the lack of oxygen, the accumulation of carbon dioxide, and the presence of an organic poison of unknown nature. No sooner had this notion become widely accepted than the laboratories began to demonstrate the inadequacy of the supposed proof of the notion. To cut a long story short, it is now known that, except under very unusual circumstances, the harmfulness of respired air is not due to its chemical components. The harmfulness of living in confined air is found in certain physical rather than chemical features—the air is too warm, too moist, and too still; and if it has not these physical features it is not harmful. We all have sat in crowded assemblies, we all have experienced the hot, humid, still days of an American summer. We all know the effects of such air on our sensations.

In what respect is hot, humid, still air harmful? To answer this question we must consult the records of many researches, chiefly on human beings, but partly on animals, that have been undertaken since Hermane, more than thirty years ago, observed that in crowded theaters and churches his own bodily temperature rose. The most recent of these researches is that of the New York State Commission on Ventilation, which has been in progress for the past two and a half years and is not yet completed. Notwithstanding that man is supposed to be a homothermal organism, there is a certain relationship between his bodily temperature and the temperature of his environment, even under the ordinary conditions of living. This has been shown by the New York commission, which found that during the months of June and July the rectal temperature of its subjects at 8 A.M. living in their own homes, was conditioned by the average atmospheric temperature of the previous night. The variation of the bodily temperature was about 1° F. for 20° F. of atmospheric temperature, although it is probable that the degree of variation can be modified by the clothing. The commission further found that, whatever the bodily temperature of its subject might be, it was lowered by confinement in an atmosphere of 68° F. and 50 per cent relative humidity, and raised by confinement at 75° F. with the same humidity, or still more by 86° F. with 80 per cent humidity. The final average bodily temperatures in a certain series of observations, where the subjects were confined in the observation chamber for from four to seven hours, were:

68° F. (20.0° C.) 50% humidity.....98.0° F. (36.7° C.)
75° F. (23.9° C.) 50% humidity.....98.5° F. (36.9° C.)
86° F. (30.0° C.) 80% humidity.....99.3° F. (37.4° C.)

Haldane and others have shown a greater elevation of bodily temperature in more extreme atmospheric conditions, and have pointed out the accompanying dangers of heat-stroke. The relation between the bodily temperature and external cold has not been so fully studied, but enough is known to warrant the statement that, in normal individuals at least, the bodily temperature can be to a considerable degree controlled by controlling the temperature and the humidity of the surrounding air. External temperature exerts likewise a definite effect on the circulatory system. The rate of the heart-beat is increased in warm, humid, and decreased in cool, dry air. The New York commission found the average rate of its subjects confined in an atmosphere of 86° F. and 80 per cent rela-

tive humidity to be 74, and in an atmosphere of 86° F. and 50 per cent humidity 66. Eastman and the writer have seen the pulse-rate increase by 39—from 67 to 106—as the temperature of the air surrounding the subject rose from 74° to 110° F. and the humidity from 58 to 90 per cent. The important and involved topic of the relation of atmospheric conditions to blood-pressure the writer must leave until the abundant data that have been accumulated by the New York commission have been subjected to a more careful examination than has as yet been possible.

Atmospheric conditions exert on the respiratory system effects of various kinds. On the rate of respiration a moderate degree of heat and humidity seems to be without effect, but there is some evidence that more extreme conditions cause a quickening of the breathing, and this probably accompanied by more shallow respirations. The more extreme conditions, too, appear to result in a lowered concentration of carbon dioxide in the air of the pulmonary alveoli, although the writer cannot yet quote figures to demonstrate this. The matter is, however, important, since a lowered carbon dioxide signifies an increased content of hydrogen ions—in other words, increased acidity in the blood. Eastman and the writer are now investigating this point with much interest. The mucous membrane of the respiratory tract is markedly affected by atmospheric conditions. Exposure to heat causes increased swelling, redness, and secretion in the nasal mucosa, and these effects are more marked when the humidity of the air is high. Exposure to cold reverses the effects.

Little can be said at present regarding the action of atmospheric conditions on the nervous system. The New York commission has expended much time and effort in endeavors to detect a possible influence of atmospheric variations between moderate limits on the ability to do mental work. The subjects were given such psychological tests as canceling arithmetic figures, adding figures, mentally multiplying three-place by three-place figures, typewriting, and more complex mental performances which involve choice and judgment. The range of atmospheric variation was from a lower limit of 68° F. and 50 per cent relative humidity, and the upper limit of 86° F. and 80 per cent humidity. In some cases the air was kept quiet, in others in motion by electric fans. In neither the young men nor the young women subjects of these tests could there be detected any relation between atmospheric conditions and either the accuracy or the amount of mental work that was performed.

The relation between atmospheric conditions and metabolic phenomena is not yet elucidated. A topic that is inviting is the possible relationship between atmospheric conditions and bacterial infections. Most of the experimental observations that have here been made relate especially to the action of temperature on the course of infections, and it has generally been found that high external temperature with accompanying pronounced increase of bodily temperature checks the progress of infections that are already existing. Somewhat lower temperatures (30° F. to 35° F.), on the other hand, seem to favor the multiplication of the bacteria and the advance of the disease.

MUCOUS COLITIS AND ITS TREATMENT.

Simon in the *New Orleans Medical and Surgical Journal* for July, 1916, reminds us that many divergent views have been entertained in the past in regard to the most effective method of handling this important and interesting disease. The prognosis at best is none too favorable, since we are dealing with a chronic functional neurosis, engrafted upon a type of patient who presents always great therapeutic difficulties. The first step should be directed, of course, toward the removing of any gross pathological lesion which might serve as the starting-point for a reflex neurosis. When visceroptosis is present in connection with the disease, Simon believes it is the first duty of the physician to institute proper

mechanical measures looking to the relief of this disability. Likewise, the presence of a chronic appendicitis, or other chronic inflammatory lesion in the lower abdomen, should call for appropriate surgical attention. In addition, it need hardly be mentioned that all procedures which tend in a general way to promote the tone and nutrition of the patient should be afforded a prominent place in the treatment.

The harmful effect of a coexisting constipation is to be recalled, and Simon is firmly of the opinion that no material benefit can be rendered the individual with mucous colitis until definite steps are taken to relieve this state. For this purpose a proper dietetic régime must be ordered. The type of diet which has been found of most service includes those articles of food which leave a large residue of undigested material in the bowel. The patient should accordingly be ordered to reduce the amount of meat and eggs to a minimum and, on the other hand, to eat liberally of the coarser vegetables, fruit, wheat bread, and fats. Simon is in the habit of giving twice a day half a glass of sweet cream, either with or between meals. The fat in these cases serves the double purpose of stimulating intestinal peristalsis and of increasing the number of food calories so necessary to the upbuilding of the nutrition.

A point of some importance, he believes, likewise, is the insistence on the part of the doctor that large amounts of water be drunk at intervals during the day. Very many of these patients neglect this important matter and in consequence suffer an unnecessary and harmful depletion of the tissues and secretions in general.

As regards the advisability of rectal irrigations, so commonly employed, Simon would like to offer some objection to this plan of procedure. He believes much more harm is done by a daily tampering with the lower bowel in this type of patient than the possible good that might be accomplished by the mere washing out of the mucus.

It should be remembered always that the underlying pathology is not of an inflammatory nature, therefore the various astringent and antiseptic bowel flushes ordinarily employed cannot be said to be in order. Even the oil enemata, according to the Fleiner method, Simon believes are open to the same objection and should be used sparingly, if at all, in this disease. If a mild laxative is needed, in addition to the diet, he sees no objection to the use of petroleum oil by mouth or even small doses of cascara. Certainly all drastic purges should be interdicted.

When pain is a prominent symptom, he has found a sedative suppository containing orthoform, belladonna, and ichthyol to serve admirably as a means of relief.

EXOPHTHALMIC GOITRE.

The *New York Medical Journal* of July 8, 1916, contains an article by AIKEN in which he makes the statement that the treatment of cases of exophthalmic goitre is always difficult, and demands a maximum of good judgment on the part of the physician if he wishes to obtain a successful result without referring them to the surgeon for thyroidectomy. It is a mistake to assume that the condition is practically incurable by medical treatment, and after a careful study of its results in the hands of various writers, including Hale White and Mackenzie, Solis Cohen concludes that there is a reasonable prospect of recovery in about seventy-five per cent of the cases, which is about the same proportion as that allotted to surgery in the hands of competent surgeons. At the same time there is no doubt that for some cases surgery is imperative, and in this respect each case should be judged on its own merits. Whatever the treatment adopted, it is exceptional for all the symptoms to disappear completely, but most authorities agree that we are justified in speaking of cure if the general condition and strength are maintained, and the symptoms are relieved to such an extent that the patient is able to resume her ordinary occupation.

The brief account which has been given of the various hypotheses in regard to the

causation of the disease makes it obvious that in the treatment it is essential to adopt measures tending to reduce excessive vascularity of the gland, thereby diminishing secretion and the tendency to hyperthyroidism. With this object in view it is absolutely necessary to secure for the patient the most complete bodily and mental rest obtainable under the circumstances, thus removing the stimulating effect on the thyroid of exercise and excitement. In some of the slighter cases a simple rest and isolation cure alone may relieve the symptoms, and if persevered in for some considerable time result in subsidence of the enlargement of the gland. During the first stage of the treatment rest should be so complete that it should not even be disturbed by the administration of medicaments. The length of time during which it is advisable for the patient to remain in bed varies in accordance with the progress of the case. The best guide in this respect is the condition of the pulse. When it has remained regular and practically normal for three or four weeks, the patient may be allowed to rest on a sofa in the room for an hour or so daily, and subsequently increase the amount of exertion very gradually day by day. The benefit of the rest cure is likely to be greater if it is possible to take it in the country, preferably in a bracing climate, and away from the ordinary surroundings of the patient.

Defective nutrition is commonly associated with this disease, and therefore a liberal and nutritious diet, similar to that often recommended in pulmonary tuberculosis, is frequently indicated. Foods rich in extractives should be avoided, the diet consisting chiefly of milk and cereals, together with fruit and the more easily digested vegetables. It should be borne in mind, however, that gastric hyperacidity is present in not a few of these cases, and that under such circumstances it is advisable to forbid acid fruits.

As regards the medicaments which have been recommended, their name is legion, and the most contradictory opinions are given by different writers as to the efficacy of most of them. Opinions differ as to the advisability of giving hypnotic drugs, such as veronal, sulphonal, and trional. Some writers recommend them for the purpose of procuring sleep and lessening excitability, while others emphasize the fact that in neurotic cases of this description the drug habit is easily formed, and not so easily given up. Williams thinks that the only sedative drug permissible is aspirin. The benefit sometimes derived from belladonna is due rather to its property of controlling glandular secretion than to its sedative qualities.

Of the bromides the only preparation which has been found useful is hydrobromide of quinine, which is highly recommended by Miller, Forchheimer, and others. Bumsted states that with it he has been able to cure several cases which had previously proved refractory to all other forms of treatment, including operation, and that one of its advantages is that it can be taken for months together without bad effects. In Aiken's own practice he has found that the most effective drug treatment is the administration of this preparation in the form of capsules or cachets, each containing five grains of hydrobromide of quinine and one grain of ergotin, the dose being given three times daily.

Leigh Watson reports beneficial results from the injection of 1 to 4 Cc. of a 30- to 40-per-cent solution of quinine and urea in fifty cases of exophthalmic goitre, the dose being repeated every third day. Two severe cases remained free from symptoms eighteen months after the last injection, and sixteen have been free from symptoms for one year.

On the assumption that exophthalmic goitre is more common in districts in which the water is deficient in lime, treatment by the administration of calcium salts has been recommended. Campbell states that during the last eighteen months he has been in the habit of treating his cases in this way, and has had better results than from any other form of medication. He does not suggest that it should be the only treatment, but that it should be combined with any other

form of treatment selected. He gives a dose of ten grains of chloride of calcium daily.

In view of the liability to digitalis toxemia in toxic conditions of the thyroid many writers emphasize the desirability of avoiding the use of this and other cardiac drugs, except in cases in which special indications, similar to those in organic disease of the heart, are present. Weiland points out that such indications are absent in the cases in which some surgeons recommend a dose of digitalis before operation, and that they should therefore be included in the category in which the drug is contraindicated.

Some writers state that they have obtained satisfactory results from administration of extract of the thymus gland, but the reports as regards treatment by organotherapy, including the administration of thyroid substance, are on the whole not very favorable, and do not compare with the brilliant results obtained in cretinism and myxedema from organotherapy. Serum from thyroidectomized sheep and milk from thyroidectomized goats are sometimes used in the forms of preparations known as rodagen, thyroidectin, antithyroidin, and have been found useful in some cases.

The fact that *x*-rays are known to have a selective effect upon glandular tissue justifies the assumption that their use may be beneficial in exophthalmic goitre, and they have accordingly been extensively used, both alone and in combination with surgery. Satisfactory results are reported by several writers, and Kienbock, Nagelschmidt, and others go so far as to say that no operation for this condition should be undertaken without preliminary treatment by *x*-rays, and that if this procedure were universally adopted it would be likely materially to reduce the operative mortality of exophthalmic goitre. Belot is of the opinion that even in the so-called abortive cases in which struma is absent, the rays have a favorable influence on excessive and dysfunction (deficient or perverse function) respectively of the glands of internal secretion, even if these abnormalities are not associated with appreciable enlargement. Dr. Dawson Turner reports successful cases, in which application of the *x*-rays was followed by diminution in the size of the thyroid and subsidence of the symptoms. This retrogressive process was associated with atrophy of the secretory epithelium and interstitial and extracapsular fibrosis.

Clinical experience shows that many cases do not respond satisfactorily to any of these methods, and in these refractory cases Aiken has found the employment of radium to be of decided benefit. Abbe, of New York, first used radium successfully in exophthalmic goitre, and his favorable experience of its results has been repeatedly confirmed by other writers. The experiments of Victor Horsley and Finzi show that the most constant changes after the application of radium affect the blood and lymph vessels. Aiken's own clinical experience shows that, when applied over the thyroid, the more penetrating radium rays diminish the vascularity and reduce the secretion of the gland.

SECOND THOUGHTS ABOUT SALVARSAN THERAPY.

In the *California State Journal of Medicine* for July, 1916, STEVENS writes on this topic. His conclusions may be expressed in the form of "Don'ts":

Don't use salvarsan unless positive indications for its employment exist.

Don't expect as much from neosalvarsan as from salvarsan.

Don't give salvarsan in the office.

Don't give salvarsan at too frequent intervals, or in too small doses.

Don't omit any details in preparing the solution to be injected.

Don't neglect to filter the solution before it is injected.

Don't cut down on a vein.

Don't inject any of the solution into the tissues surrounding the vein.

Don't administer too large a dose at the first injection, especially in the early secondary stages.

Don't inject salvarsanized serum pre-

pared from a Wassermann positive blood into a canal containing Wassermann negative spinal fluid.

Don't inject a quantity of salvarsanized serum larger than the amount of spinal fluid removed.

Don't inject air into the spinal canal.

Don't use intradural medication under any circumstances until the intensive treatment with intravenous injections of salvarsan, mercury inunctions or injections, and potassium iodide has been given a thorough trial.

A TRUSTWORTHY NON-POISONOUS ANTISEPTIC.

In the *New York Medical Journal* of July 8, 1916, GREGORY says it is a good time to remind the entire medical profession, and especially the surgical end of it, that calendula will kill all pus germs. As the drug may not be familiar to some, he will say that he refers to the non-alcoholic fluid extract of calendula, which is *Calendula officinalis,* the common or garden marigold. Perhaps fifteen years ago Gregory read in some medical journal that "a good extract of calendula will absolutely prevent the formation of pus in all contused and lacerated wounds, no matter how dirty, unclean, and far from aseptic they may be." He concluded that this statement was probably exaggerated, but tried the remedy, and found that it made good in every instance. He has done a good deal of accident and emergency surgery, and has had some exceedingly filthy wounds to treat, caused by railroad and stone quarry accidents, contaminated by coal dust, machine oil, and dirty clothing, and not one of them has ever produced a drop of pus when dressed with a good extract of calendula.

Extensive burns are pretty sure to become contaminated from burned clothing and other causes, and if dressed with linseed oil and lime water will be covered with foul, yellow pus in about two days. If dressed with calendula and saturated solution of boric acid, the burns will remain perfectly clean and sterile till healing is complete. Besides its antiseptic qualities, calendula alleviates the pain of burns better than any other remedy ever discovered. It is so much better than dilute picric acid that any one who has used it for burns will never care to use the acid. Gregory wishes to make his meaning perfectly clear; he does not mean that it has sometimes, or occasionally, prevented pus formation in dirty wounds, but that it has absolutely inhibited the formation of pus in every wound that he has ever dressed with it.

If you ask him how it does this, he has to say frankly that he does not know, as chemistry can tell us nothing about it that he knows of. It is a non-poisonous plant, often used internally, and is the best remedy he has ever found for a certain very acute and inflammatory type of gastric catarrh.

If any of the readers of the *New York Medical Journal* have been called to treat a badly bruised or wrenched knee-joint with a violent acute synovitis rapidly setting in, they know what wreck and ruin is likely to take place unless the doctor is both energetic and skilful. In a case like this, two ounces of concentrated extract of calendula, six drachms of lead acetate, to one pint of hot water, applied on compresses of absorbent cotton, will work a wonderful cure. The lotion must be applied very hot, and the compresses must be changed before they get cold. This treatment, faithfully and energetically followed up for three days and nights, will positively prevent effusion, suppuration, and the wrecked and ankylosed knee-joints that he used to see in his hospital days. This treatment is equally good for a badly sprained ankle.

He wishes especially to warn the profession to get a reliable preparation of this remedy, as there is much on the market that is almost worthless. The reliable fluid extract is so concentrated that it is almost of the consistence of syrup. In that form of erysipelas in which a light-red surface is interspersed with numerous pustules, and which is most certainly a mixed infection, calendula, lead acetate, and saturated solution of boric acid will effect a prompt cure.

An exceedingly efficient treatment for very bad cases of leucorrhea contains equal parts of non-alcoholic calendula, non-alcoholic hydrastis, and glycerin. This prescription can be used on tampons, or with hot water as a medicated douche. Where patients object to the present very high price of hydrastis, the calendula, boric acid, and glycerin can be used with great success.

General knowledge of the power of calendula as a germicide, and its general use in hospitals and surgeries, would prevent thousands of cases of infection and suppuration every year. It is no new or experimental remedy. It has been thoroughly tried out. It has stood the test of years, and it is absolutely sure death to all pus germs whatsoever. But it must be the right calendula. Many a man, not knowing good from bad, has tried some preparation of the drug, got no good results, and concluded that the claims made for it were false.

SPINAL ANESTHESIA AND ITS USE IN THE TRENDELENBURG POSITION.

In the *Lancet* of June 24, 1916, STEWART writes upon this topic. The use of the Trendelenburg position in the production of spinal anesthesia is not, of course, a new procedure, as it was advocated many years ago by Jonnesco and other continental surgeons, of whom Saradnicky reported 600 cases without any bad result. In the last few months Stewart has used spinal anesthesia in nine cases in which the Trendelenburg position was employed: (1) Wertheim's operation for carcinoma uteri; (2) three cases of pyosalpinx (one of both tubes); (3) two cases of prolapsus uteri (Gilliam's operation); in one case appendicectomy also done; (4) one case of parametritis and pelvic peritonitis; (5) two cases of suprapubic prostatectomy. There were no bad effects or after-effects, except slight headache in one case. By giving a preliminary injection of morphine and atropine Stewart has found it unnecessary to give general anesthesia in these cases.

Stewart notes that in Page's list of cases ventral hernia, intestinal obstruction, gastrojejunostomy, ruptured liver, are mentioned, in which he presumes the Trendelenburg position was employed only for the purpose of producing anesthesia, etc., and not for facilitating the operation, as such a position would increase the dangers and difficulties of the operation; although if such be the case he cannot quite understand the reason for waiting fifteen or twenty minutes before placing the patient in the Trendelenburg position. Page does not state the site of his injection, but it is surely unnecessary to resort to the Trendelenburg position for such cases, as complete anesthesia of the whole abdomen can be obtained usually in five minutes by injecting into the space between the twelfth dorsal and first lumbar vertebræ.

Stewart has employed this method in many operations on the upper abdomen, such as perforated gastric ulcer, gastroenterostomy, gastrostomy, acute intestinal obstruction, etc., with perfect anesthesia and complete relaxation of the abdominal walls, merely raising the buttocks for a few moments until anesthesia is produced, and keeping the head and shoulders slightly raised all the time, thus obviating the danger of respiratory failure. In using the dorsolumbar method for operations in the upper abdomen Jonnesco kept the patient in the sitting position for a few minutes, and afterward in the dorsal position with the head raised, only resorting to the Trendelenburg position for a few minutes when the anesthesia was incomplete. Stewart has seen no bad effects, however, from placing the patient in the dorsal position immediately after the injection, and the anesthesia is surer and produced sooner.

It was pointed out by Jonnesco that injection in the dorsolumbar space gives a more perfect anesthesia than in the classical site between the third and fourth lumbar vertebræ, and Stewart is convinced that the percentage of failures requiring general anesthesia is much less if one employs the higher site, while he has had no bad effects in over 100 cases in which he has used this

method. He ought, however, to add that for injections in the dorsolumbar space he invariably uses a mixture of strychnine and stovaine (average dose 6 cgr. stovaine and 1 mgr. of strychnine prepared in ampoules by Martindale) as originally advocated by Jonnesco. For operations in which the Trendelenburg position is employed the addition of strychnine seems especially desirable to obviate the risk of respiratory failure.

TREATMENT OF ECLAMPSIA.

In the *American Journal of Obstetrics* for July, 1916, KNIPE and DONNELLY point out that each plan of treatment has its earnest advocates. This is natural and to be expected, as it is in every problem of medicine about which there may be a difference of opinion.

And yet, owing to the fact that we are accustomed to look to surgery for quick results in so many pathological conditions, so the operative treatment of eclampsia has become unduly popular in the last five years, to the exclusion of older methods which have been tried and not found wanting.

Knipe and Donnelly believe that this is a mistake. They show by the analysis of eighty-three cases which have been treated during the last five years in the University Maternity that their results have been better and their mortality lower than by any radical operative treatment that they know of.

The treatment that is prescribed at the University Maternity is as follows:

Lavage of the stomach; 2 ounces of castor oil given through the stomach-tube; twenty to thirty minutes' sweat in the sweat cabinet; hypodermic of morphia, gr. ½, is given if the convulsions are violent or frequent; hypodermoclysis after the first sweat, followed by proctoclysis midway between the subsequent sweats; venesection if systolic blood-pressure is over 180, and more particularly if the diastolic pressure is high; an initial dose of veratrum viride (10 minims) followed by nitroglycerin gr. 1/100 at four-hour intervals. Puncture of membranes if pregnant or in labor and abstention from any operative interference to hasten delivery, which they find is spontaneously terminated in from eight to ten hours from the institution of treatment.

It is not their purpose to draw attention to anything except the treatment of eclampsia, but it is necessary to elaborate somewhat on the type and severity of their cases, so that we may infer the results of the treatment.

Of the eighty-three cases of severe toxemia of pregnancy treated in the Maternity from 1910 to 1916, forty-eight had convulsions before delivery. Of these they have a definite record of seventeen having had convulsions after delivery also, but as the details of some of the records were rather poorly kept during this period, it is reasonable to presume that there were more than seventeen cases in which the convulsions continued after delivery because the eliminative treatment was continued for quite some time.

Twenty-four had convulsions after delivery only. Of these, four died, a mortality of 16.66 per cent.

Ten cases were admitted in various stages of their pregnancy with severe toxemia and all the symptoms of impending eclamptic convulsions. These cases were relieved by eliminative treatment, and either discharged before delivery or delivered without the onset of convulsions.

Two cases were delivered by vaginal section—with one death immediately after delivery.

Six cases died within a very few hours after admission and after delivery. Of these, four cases never revived from the state of coma in which they were admitted.

One case died in a convulsion after being delivered.

Another case, delivered before admission, died suddenly after responding well to eliminative treatment. Post-mortem showed cerebral embolism.

Four cases had previous attacks of eclampsia, one case having had convulsions in two former pregnancies.

Craniotomy was performed in one case.

One case died in the hospital, one month

after admission, of general toxemia and nephritis.

The total mortality of these eighty-three cases, whether the deaths occurred only fifteen minutes or one month after admission, was fourteen, or 16.8 per cent. If they exclude those cases dying within twenty-four hours, but including the case dying a month afterward, their mortality was five, or 6 per cent.

It is hardly reasonable to include cases dying within twenty-four hours in any statistics upon eclampsia. Even those favoring Cæsarian section in all cases will admit that the ratio of their success is in inverse proportion to the number of convulsions, and therefore it is reasonable to assume that cases admitted so late in the disease as to die within twenty-four hours would be so saturated with toxemia that any operative procedure would be unavailable. Therefore, they repeat, if they exclude those cases dying within twenty-four hours, most of them within a few hours, their mortality is 6 per cent.

It may be well to draw attention at this point to a very important fact, and that is, within the last five years there has been a tendency on the part of those doing Cæsarian section for eclampsia not to include cases of postpartum eclampsia in their statistics. As we have seen, those cases developing eclampsia following delivery have been a considerable proportion of their total number, namely, twenty-four out of eighty-three, and as is well known, these postpartum cases have a higher mortality than those developing convulsions before delivery.

THE TREATMENT OF ASTHMA, ARTHRITIS, AND GONORRHEA BY PHYLACOGENS.

In the *Medical World* for July, 1916, HAY reports his results with phylacogens. He says that in some cases of asthma results have been brilliant, but not so generally favorable in hay-fever; in rheumatism just enough splendid results to keep him looking to phylacogen as a remedy that should be included in the armamentarium of every well-equipped physician. While there are some disappointments in the administration of phylacogen, a certain percentage may be justly attributed to errors in diagnosis and to certain cases that, for some unaccountable reason, fail to respond to this form of active immunity.

To summarize the results in the cases treated by Hay, he finds that 79.1 per cent have been cured or improved very materially, while only 20.9 per cent have failed to be benefited. In a majority of the cases the failure no doubt was due to incorrect diagnosis. With his own experience and after reading many case reports of reputable physicians, he is convinced that the phylacogens are the most efficient, reliable, and satisfactory therapeutic agents now available for treating conditions where indicated.

AURICULAR FIBRILLATION: ITS RECOGNITION AND TREATMENT.

GORDINIER in the *Albany Medical Annals* for July, 1916, makes the somewhat broad statement that no form of cardiac disorder is more amenable to proper digitalis medication than auricular fibrillation. He thinks if we will pause for a moment to review the salient features of this disordered cardiac mechanism, we will find ample justification for the above statement. For with the inception of this abnormal rhythm the whole myocardium is rendered more irritable from overexcitability, the result of innumerable stimuli constantly flowing from the auricles to the ventricles over His's bundle. This constant increased conductivity rapidly exhausts the two most important functions of the heart muscle, contractility and tonicity. We have been taught both from animal experiments and clinical studies that digitalis reduces cardiac rate by vagus stimulation through its effect on the cardioinhibitory centers in the oblongata, as this action may be inhibited by blocking the vagus impulses through the administration of atropine. It has also been known for a long time that this drug has a selective action directly on the muscle fibers of the

heart independent of their nerve supply, improving in marked degree the functions of contractility and tonicity. In addition we know from polygraphic and electrocardiographic studies that one of the earliest effects of digitalis is to delay conductivity through the bundle of His by increasing the auriculoventricular interval, causing, if the action is pushed, definite heart-block. This action of the drug is valuable in fibrillation by reducing the number of impulses from the auricles to the ventricles, thus relieving their irregularity, slowing their rate, and increasing their period of rest, thereby permitting a proper filling of the ventricular chambers. It also strengthens their systolic contractions, thus relieving them of their residual blood and increasing each systolic output, with ofttimes complete relief of the general venous stasis.

In laboratory animals and healthy men digitalis increases blood-pressure by constricting the small arteries through vasoconstrictor influences. On diseased hearts, however, great discrepancy of opinion exists as to whether such pressure effects ever occur. It seems reasonable to believe, especially with fibrillation with edema and low blood-pressure, that such results occur, chiefly through its effect on improving the contractile force and tone of the heart muscle, thus improving the systolic output, thereby reducing the size of the dilated chambers by relieving them of their residual blood and permitting a better coronary arterial flow, thus improving the nutrition of the heart muscle. Its diuretic effect is not primarily renal but is doubtless due to its selective action in increasing the force and strength of the heart muscle, thus delivering to the kidneys a greater volume of blood, relieving their venous stasis, and relieving the general edema by producing active diuresis. Clinical experience teaches that when a good active preparation of digitalis fails to influence for good the strength of the heart, no increased urinary output occurs. Because of these well-known pharmacologic actions of the drug, we have in digitalis a most valued weapon, whereby we may relieve and prolong the lives of these unfortunate patients so that they may live months or years with comparative comfort, often being able to work at their usual vocations.

The effects from the use of digitalis or allied drugs in fibrillation are oftentimes no less than marvelous, patients in immediate peril of death being relieved as if by magic; the deficit between the cardiac impulse and radial artery gradually ceasing, the dyspnea and edema fast disappearing, the irregularity of rhythm and rapid rate quickly improving; and in the case of fibrillation associated with mitral stenosis the presystolic murmur long since absent often reappearing with the improvement of the functioning of the auricles. The drug to be effectual must be used at first in doses sufficiently large to produce definite physiological effects—*i.e.*, distinct lessening of the irregularity and slowing of the pulse-rate, the rate of apex and the radial pulse gradually becoming the same. When their rates reach seventy per minute it is wise to discontinue the drug for a few days, carefully watching the heart-rate in the interval, and if it again becomes rapid, reaching ninety or more, then to give enough digitalis to keep it at about the normal rate, thus continuing the smaller doses over long periods of time, only ceasing when the rate keeps normal and no deficit occurs, or the drug produces some toxic effect, such as vomiting, severe headache, marked sinus irregularity, delayed conductivity, bigemina, or actual heart-block.

No drug of this series can in the writer's judgment approach at all the good effects of an active preparation of digitalis. It is true that occasionally certain individuals seem to possess an idiosyncrasy for the drug and can take it neither by the mouth nor subcutaneously. In such patients the drug may be used intravenously, or the substitution of strophanthus, squills, convallaria, adonis, or spartein may be tried. The writer's preference is either for a good tincture, a fresh infusion, or recently collected dried and compressed leaves. In

endeavoring to bring prominently before us the great value of this drug in the treatment of fibrillation, he does not wish in those cases of fibrillation with edema to underrate the good that comes from absolute rest, restricted fluid intake, salt-free diet, and careful elimination, or in combination with digitalis of such diuretics that act upon healthy renal epithelium, as caffeine, theobromine, theocin-sodium acetate, or agurin. These latter drugs should not be given in pure renal dropsy. The writer wants also here to emphasize the fact that belladonna or atropine should never be administered in this condition, unless for some very definite reason, such as the onset of a sudden fulminating attack of pulmonary edema, as its action is to paralyze the peripheral terminations of the vagus nerve, thus accentuating the fibrillation.

In closing, just one other point, namely, the value of caffeine in overcoming digitalis arrhythmias that do not cease when the drug is discontinued.

REAMPUTATIONS.

Skirving (*Journal of the Royal Army Medical Corps*, May, 1916) noted many stumps which required reamputation because of the skin turning in, leaving bare the bone and at times causing retention of pus. Plenty of bone should be taken away. The vessels were hard to catch because of the hard inflammatory tissue in which they were embedded. Drainage should be free. Secondary amputation wounds were usually actively infected and were best treated by continuous irrigation. Secondary hemorrhage was fairly common. Traction on flaps was required to prevent a recurrence of the skin growing in.

SPINAL ANESTHESIA.

Knight (*American Journal of Obstetrics and Diseases of Women and Children*, June, 1916) reports 305 cases—all below the diaphragm, almost all below the umbilicus. There was no fatality.

Strauss reports a mortality of 1 in 3500; McCardie reports 23,955 cases with 29 deaths, or 1 death in every 826 cases; König reports 2400 cases with 12 deaths, or 1 in 200; Thomaschewsky, 1 in 17,847.

The majority of fatalities occurred in the early experience with this method, but with the improvement of technique the mortality has been reduced.

When a solution of an anesthetic is introduced into the fluid of the cerebrospinal canal it either rises or falls, as its specific gravity varies in relation to that of the cerebrospinal fluid. The cerebrospinal fluid has a fairly constant specific gravity of about 1.0065. It is therefore important to have the anesthetic fluid distinctly heavier or lighter than the spinal fluid, and also important to place the patient in such position that the anesthetic fluid will flow toward the distal extremity of the spinal canal. As the anesthetic comes in contact with the nerve roots it blocks their impulses more or less completely, thus causing loss of sensation and motion. The autonomic organs remain uninfluenced. After the injection the loss of sensation, pain, motion, and touch gradually increases from below upward and in the order given. The sense of touch is the last to disappear. In many cases it remains throughout the operation, varying in accordance with the amount of anesthetic and the susceptibility of the individual. The persistence of the sense of touch is occasionally a great handicap in the management of nervous individuals, for as these patients are usually apprehensive they may complain, when the operation is begun, and interpret their sense of touch as pain, when in reality their sense of pain has been abolished.

Anesthesia begins a few seconds after the injection and lasts about an hour, varying more or less with the dose and the size of the individual. The abdomen becomes relaxed when the anesthesia is established; abdominal breathing is minimized, as well as efforts at coughing and straining. A considerable number of patients are nauseated or vomit in the early period of the anesthesia, but this is very transitory and usually of little moment. The intestines,

which are of autonomic control, show active peristalsis and are never paralyzed by the anesthetic.

The anal sphincter becomes relaxed, and consequently operations about the anus and rectum are facilitated.

The bladder sphincter apparently does not participate in the same relaxation, for no cases of incontinence have been noted, and furthermore it is of importance to use the catheter in individuals who receive large quantities of fluid in one way or another during or shortly after operation, as the bladder may become distended before the anesthesia is abolished.

Blood-pressure is uniformly reduced in proportion to the amount of anesthetic used. The higher the cord is anesthetized the greater will be the extent of vasomotor paralysis. The effect on the blood-pressure is at its maximum early in the anesthesia, and after a few minutes gradually passes off. Owing to this phenomenon myocardial disease, and any condition accompanied by hypotension, contraindicates the use of spinal anesthesia. On the other hand, any condition accompanied by hypertension should be materially benefited by it. Therefore it is indicated in conditions of the heart affected by pressure, as arteriosclerosis, nephritis, in labor during the overload of a weakened heart, in pulmonary tuberculosis, during the hypertension of eclampsia, and in conditions where shock is anticipated from the operative procedures.

The pulse-rate rarely changes throughout the anesthesia.

Respiration should be observed with the greatest watchfulness, for it is with this function our danger lies. The respirations will become diminished in proportion to the height of the cord involved. It is important to keep the patient in such a position as to compel the anesthetic to flow in the opposite direction to the respiratory center. Stovaine applied to the upper cervical segments of the cord, in sufficient quantity, will cause paralysis of the respiratory muscles, and if artificial respiration is not resorted to death will ensue. Should such an accident occur, artificial respiration should be persisted in until the effect of the anesthetic on the respiration passes off. The author has had but one such experience. The patient suddenly ceased to breathe. The pulmotor was applied for ten minutes before any voluntary effort at respiration was made, yet at the end of thirty minutes normal respiration was restored. With the use of an anesthetic solution which is lighter than the spinal fluid, and with the patient in an exaggerated Trendelenburg position, there is little if any danger of paralyzing the respiratory center.

The after-effects seem to be greatly exaggerated in the minds of those prejudiced. Postoperative vomiting occurred in 3 per cent of the cases, and headache, with or without pain and stiffness in back of neck, in one per cent of the cases.

Complete failure of anesthesia occurs in 1½ per cent of the cases, and later this was found to be due to the old age of the anesthetic solution.

In two cases the anesthesia was delayed. These cases received ether, and upon recovering from the ether the lower portion of the body was paralyzed and anesthetic.

Supplementary anesthetics were used in 10 per cent of the cases. In a few of these, the cases in which the operations were unduly prolonged, and in a few of the abdominal cases, ether in small amounts, nitrous oxide, or novocaine injected locally was resorted to.

Narcotics were given in one per cent of the cases prior to the anesthetic. Morphine is objected to by some operators, as it is also a respiratory depressant and might add to the depressant effect of the stovaine.

The preparation of the patient for the anesthetic is the same as for a general anesthetic, except that the taking of fluids is unrestricted.

One hour before leaving the bed, a hypodermic injection is given consisting of morphine sulphate gr. ¼ and atropine sulphate gr. 1/150, and a sufficient amount repeated to allay all anxiety and produce drowsiness and indifference, or the so-called "twilight state." Absolute quiet about the patient is maintained, and before re-

moval to the operating-room the eyes are blindfolded and the ears covered so that surroundings are excluded as much as possible from the patient's knowledge, and the transfer to the operating table is made as gently as possible. The patient is placed in sitting posture upon the table with legs hanging over the side and shoulders drooped, with head resting upon the attendant's shoulder so as to bow the vertebral column as much as possible, thus giving maximum separation of the spines.

Tincture of iodine is applied to a liberal area of the back surrounding the site of puncture. The third or fourth interspinous space in the lumbar region is located.

The site of the injection is anesthetized by ethyl chloride and the trocar and cannula placed with its point at the upper limit of the interspinous space, and immediately below the tip of the spine.

The trocar and cannula are now gently pushed in, in the middle line and at right angles to the vertebral column, until it meets with some considerable and elastic resistance, which is the membranes of the canal and the immediately adjacent ligaments. A slight increase in the thrust will puncture the canal, and upon withdrawing the trocar a few drops of the spinal fluid may be allowed to escape, to prove the position of the cannula. One should never be satisfied that the cannula has entered the spinal canal until he sees the escape of the spinal fluid. Should the cannula be inserted too far it may penetrate the filaments of the cord and cause pain in the lower extremities; it should then be withdrawn a little until the spinal fluid runs out freely.

Dr. Babcock's solution of stovaine was used in all the writer's cases. Its specific gravity is less than that of the spinal fluid, and consequently the patient is placed in an exaggerated Trendelenburg position immediately, so as to limit its action to the lower filaments of the cord. Should the patient be unable to sit up, the injection may be made in the horizontal position.

Dr. Babcock's solution is dispensed in 2-Cc. ampoules, sterilized and ready for injection, and consists of stovaine 0.08, lactic acid 0.02, absolute alcohol 10.2, distilled water q. s. 2 Cc.

The amount of solution injected varies somewhat with the size of the individual, usually from 1 Cc. to 1.6 Cc.

The point of the trocar and cannula should have a sharp and short bevel, for if the bevel of the point is too long only part of the opening may enter the canal, and then when the injection is made it may escape into the tissues outside the cord and a failure will result.

The trocar should be of small caliber and about 10 cm. long, with a connection ground to fit the outlet of a 2-Cc. Record syringe. The syringe and needle should never be used for any other purpose, and should always be sterilized by boiling in plain water. Alkalies or antiseptics destroy the properties of the stovaine and should never be used. A fine gray precipitate may form when the stovaine solution is drawn up in a syringe boiled in soda water, and the anesthetic action of such a solution may be completely destroyed.

CONCERNING GUNSHOT INJURY OF THE PERIPHERAL NERVES.

Stopford (*Lancet*, April 1, 1916) from the observation on behalf of the Medical Research Committee on upwards of 90 cases suggests that the following factors must be considered as influencing the prognosis and treatment:

The extent, character, and distance from the periphery of the injury. Extensive damage to the surrounding structures increases the formation of scar tissue, which by its contraction is liable to strangle the nerve. Irregular missiles, as shell casing, tend to lacerate the nerves themselves more than bullets. A nerve which is in a state of tension at the time of the reception of the injury is more likely to be torn than one which is lying slack, and consequently the position of the limb influences slightly the predisposition to laceration. It is well known that peripheral injuries of nerves have a better prognosis than more central ones in the region of the nerve roots.

Such complications as fracture and sepsis obviously add to the gravity of the prognosis. They both magnify the risk of secondary implication of the nerve in either callus or fibrous tissue.

The treatment before the case comes under observation is also important, as failure to relax the paralyzed muscles during the early stages appears to be a very potent cause of delay in recovery.

The amount of cicatricial tissue formed around the nerve. Excessive fibrosis and the frequency of incomplete division constitute, to a considerable extent, the differences between war injuries of nerves and those encountered in civil practice. The effect of fibrous constriction during healing is most significant in the study of these cases, and its influence upon prognosis and treatment cannot easily be overemphasized.

For convenience of discussion the clinical progress, in a large proportion of nerve injuries, may be said to follow one of the four following courses (although, it must be understood, it is not possible to include a few cases exhibiting several complications in such a graphic manner):

1. Improvement seen in the sensory manifestations within a few weeks, followed by restoration of tone and voluntary contraction in the paralyzed muscles. This is succeeded by a steady increase in power until there is a complete recovery within four to eight months. The cases following this course are probably examples of physiological division, the missile having passed close to the nerve without dividing any fibers and the wound healing without any compression of the nerve.

2. No improvement of any form even after four to six months. All of these cases are clinically examples of complete anatomical division, and surgical means alone can procure any recovery.

In these two diverse groups the treatment is obvious, but in the next considerable difficulties are encountered.

3. Fairly rapid improvement in the sensory or motor symptoms, or both, up to a point when further progress becomes more tardy but very slowly continues. These are possibly instances of incomplete anatomical division, but the divided fibers regenerate because they are in good apposition, and there is a minimal amount of cicatricial tissue. Surgery cannot accelerate the recovery of this group, and the essential point is to differentiate it from the succeeding one. As Sherren has shown, in cases of incomplete division the recovery of epicritic and protopathic sensibility is simultaneous.

4. Improvement, which abruptly ceases or is followed by a relapse. This is an important group and contains a considerable number of cases. The relapse, as may be anticipated, is almost invariably due to compression of the nerve by fibrous tissue or callus.

In the cases of relapse or sudden cessation of all recovery the nerve is found on exposure to be compressed by fibrous tissue, or to contain a fibroma or extensive intraneural scar. The progress of regeneration is interrupted by the excessive formation of fibrous tissue, which usually necessitates neurolysis or excision of the fibroma with suture of the divided fibers, and therefore it is of the utmost importance to be able to diagnose this class of cases as soon as possible from those in the previous group, in which recovery will generally occur without surgical intervention.

From his own experience it seems possible to recognize the presence of compression of a nerve in most cases by means of the simplest clinical tests for the cutaneous sensibility to "light touch" and "pain" in its sensory distribution.

TECHNIQUE OF SUPRAPUBIC CYSTOSTOMY IN BADLY INFECTED CASES.

WILLIAMS (*Annals of Surgery*, June, 1916) notes that the following procedure has been adopted during the last twelve months for suprapubic cystostomy, where a delay of a few days or a week is permissible, and in those cases in which the bladder is badly infected, in order to aid by every possible means the recovery of a patient who is often old and decrepit, with

arteriosclerosis, thickened bladder, and perhaps grave renal insufficiency.

Every surgeon knows how readily a normal bladder wall will unite when infection is absent or at a minimum, and the wall itself has been treated in a gentle and clean-cut manner. Until recently the operation was performed at one sitting, whether for the removal of a foreign body or enucleation of the prostate; but this has been largely given up for the so-called "two-stage" operation, with much better results. This procedure goes a step farther in the class of case just mentioned, in order to insure the patient against the risk of septic infiltration of the paravesical connective tissue with its often serious consequences.

Formerly surgeons went boldly down to the bladder and opened the cavity immediately. If tearing and bruising occurred, septic infiltration of the tissues sometimes followed, with unfortunate results.

The procedure adopted then to seal the wound is here briefly outlined and is quite simple:

A general anesthetic with its evident dangers in this class of cases is quite unnecessary. Some form of cocaine is used. The vertical incision is adopted rather than a transverse, so as to keep the superficial and deep parts of the wound parallel and present a solid wall on either side when completed, rather than an elongated skin wound stretching at right angles. The muscles are separated in the usual manner and the fatty tissues, with often large veins, carefully incised, but not torn or roughly handled, since hemorrhage often occurs and may be difficult to control. M. Guyon met with severe hemorrhage in his second case.

Treves lays great stress on this point when he says that "prevesical fat should never be torn through; all such rough manipulations open the way for urinary infiltration."

In order to insure safety of the peritoneum, a catheter with an ordinary bulb is previously passed through the urethra and the bladder cautiously, and with extreme care, gently inflated. A warm boric solution is sometimes used instead of inflation, and by some is considered safer. This brings the bladder wall into view and pushes the peritoneum out of danger. The fat is carefully reflected sideways and upward, and the muscle fibers of the viscus are now easily recognized.

Gussenbauer, Sonnenburg, and Kramer mention cases in which the peritoneum was adherent to the pubis. If this condition be found it matters little, since it can be dissected away, displaced upward, and, if necessary, sutured. The five or six days that elapse before the bladder is to be opened insure the safety of the abdominal cavity. The bladder is now cleaned to the required diameter, according to the object to be removed. If for simple drainage, the space may be small. A guy suture of thread or silk is placed through the muscular coat on either side, fairly close to the median line, and left *in situ*, the ends being brought up through the wound for future use. A strip of sterile gauze about 3 cm. wide is packed into the depth of the wound and into the postpubic space on either side, gradually and completely filling the cavity and forming a space perhaps 3 cm. or more in diameter. No sutures are inserted. An ordinary dressing is placed over the wound. The operation only takes a few minutes, without the least shock or inconvenience to the patient.

At the end of the fourth day at the earliest, but one week usually, the second stage is undertaken. The packing is carefully removed and the wound found to be completely sealed in all directions. The bladder wall is easily recognized, and the guy sutures point out the line of incision, which, under a few drops of cocaine, is made in a vertical direction to the required length. Great care is taken not to clamp or bruise the bladder wall in any way. The finger is carefully inserted, and a tube, if used, placed in position, the decomposing urine immediately pouring through the opening, but the granulations which have sealed the wound prevent any contamination of the paravesical cellular tissue.

During the after-treatment the skin remains normal in color without the least sign of induration. There is no pain around the edges of the opening, and the general appearance of the wound is all that can be desired. In fact, other conditions being equal, a rapid normal healing takes place, with delayed union and primary fistula brought to a minimum. The comfort of these patients is in marked contrast to the discomfort experienced after the immediate cystostomy previously performed, which often left a dusky infiltration of the skin, sloughing tissues, and all the dangers of thrombosis and sepsis, with continual care and attention of the nurse and with pain and misery to the patient.

For suprapubic prostatectomy, in the worse forms of infected bladder, the "three-stage" operation is now always performed. For vesical calculus this method is ideal.

INTRADURAL NERVE ANASTOMOSIS IN SELECTED CASES OF POLIOMYELITIC PARALYSIS.

SHARPE (*New York Medical Journal*, July 1, 1916) states that for the past two years the writer has carried out a series of experiments upon animals in nerve anastomosis in the spinal canal, to accomplish caudal root anastomosis in marked cases of paralysis of a lower extremity, following poliomyelitis. The results of these experiments will be given later. Of course, no results of nerve regeneration are to be expected until a period of at least six months has elapsed since operation.

Three cases which were operated on in conjunction with Dr. William Sharpe are reported at this early date for two reasons: (1) The results of previous experiments, and of the writer's own experiments on animals, are such as to promise well for restoration, at least partial, of function; (2) as the individual surgeon sees but a few patients with the extensive paralysis of the legs suitable for this operation, this report may arouse the interest of other neurological surgeons in these otherwise hopeless cases. The operation of intradural nerve anastomosis of the cauda equina roots is not more formidable than the frequently performed operation of laminectomy with opening of the dura. Beyond rigid asepsis and a carefully worked-out technique the greatest requirement is patience and knowledge of the anatomy of the cauda equina and the arrangement of the nerve roots.

It is too early to report upon the results of these operations.

INTRASPINOUS TREATMENT OF SYPHILIS BY SALVARSANIZED SERUM.

STONER (*Cleveland Medical Journal*, April, 1916), working for a period of fourteen months upon forty cases of the various manifestations of neurosyphilis, reports upon a total of 141 intraspinous treatments; the greatest number given to a single case being 10, the least number 1. The patients in addition were treated by mercury injections and intravenous injections of salvarsan.

The quantity of salvarsan in a single treatment has been from ¼ mg. to ¾ mg. in 15 Cc. of blood serum, the latter being salvarsanized *in vitro* according to the method of Ogilvie. The cases included tabes, paresis, hemiplegia, psychoses, dementia, meningoencephalitis, cerebral and cerebrospinal syphilis. Ten per cent are reported as markedly improved in symptoms such as pain, sphincter disturbances, anemia, and in general mental and physical state.

Twenty cases, or 50 per cent, showed a degree of improvement. Six cases showed no clinical improvement, or 15 per cent. One case, being an advanced paretic, grew progressively worse and died after two treatments.

The most striking improvement was in those cases that had had intensive general treatment without complete relief, such as cerebral syphilis with agonizing head pains. It is interesting to observe that one intraspinous treatment will give relief where much general treatment has failed. The striking illustration is the type of case that

develops signs of cerebral syphilis in the midst of active general treatment or subsequent to it, where lumbar puncture findings show a very high cell count, a positive Wassermann, and syphilitic globulin. It is this "so-called" early case that is completely relieved on intraspinous medication, and the laboratory findings on the fluid are made negative. The sense of indescribable relief that certain cases experience from intraspinous treatment is gratifying; in fact, this is so evident that certain cases ask for further treatment. This is especially true in tabes and cerebrospinal syphilis.

Ten per cent of the cases were completely negative to Wassermann, cell count, and globulin; 28 per cent were brought to a normal cell count. All findings were reduced in 50 per cent.

Intraspinous injections were provocative of positive findings which had previously been negative in 10 per cent.

The reactions from treatments consisted of exacerbation of characteristic pains of the disease, which come on in about two to four hours subsequent to treatment and disappear completely in twelve hours in most cases. Routinely, codeine sulphate in ½-grain doses is given for relief. Approximately 25 per cent of the cases had no pain reaction whatsoever. Head pains do not follow; these one not uncommonly observes following lumbar puncture for diagnostic purposes, where the patient is allowed to get up in twelve hours. One night in a hospital is sufficient to carry out this treatment safely.

The cerebrospinal fluid shows positive in approximately 100 per cent of the cases of neurosyphilis, and this is generally parallel with a lymphocytosis and a syphilitic globulin such as is evidenced by the Lange or Nonne-Apelt tests.

In this relation remarks concerning the Wassermann reaction are relevant. Swift (*Cleveland Medical Journal;* quoted from the *Journal of the American Medical Association*) calls attention to the fact that "In performing the test, five different biologic substances are employed, four of which may be considered as reagents which have not the fixed value of chemical bodies, but which vary in their properties according to the method of preparation, age, manner of preserving, and other factors which are not understood. Because of the lack of uniformity in performing the test, the results should be judged from the clinical point of view. If the reports from a laboratory vary to any marked degree when the serums from a group of patients are submitted from time to time, it is safe to conclude that the methods employed in that laboratory are not well standardized. Whatever level is chosen can be fairly closely maintained by paying attention to the following points: (1) One should have a certain standard for the various components of the hemolytic system which must be tested each day. (2) One should use several antigens and compare a new one with old ones of known value before accepting it. (3) One should insert as controls not only serums which on the previous day gave strong positive and completely negative reactions, but also a serum which has given partial fixation." His final remarks are of especial significance: "Disappearing reactions are better indicators of sufficiency of treatment in late syphilis than in the early stage of the disease. A persistent positive reaction indicates the presence of syphilis somewhere in the body, and the first three or four years of treatment should be continued until the reactions remain negative. With reactions that cannot be influenced, a course of treatment should be given annually. In aortitis, persistent reactions while the patient is under mercury and salvarsan disappeared on continued administration of iodide. Because of the variability in the various reagents and lack of uniformity in performing the test in various laboratories, it is essential that there should be close coöperation between the laboratory and the clinician, for the clinician should be the interpreter of the reaction."

In discussing the examination of the spinal fluid, Draper notes that the four examinations employed are cell count, the globulin determination, the Wassermann reaction, and the Lange colloidal gold test.

The cerebrospinal fluid shows some change in 100 per cent of early cases. The globulin test, he claims, is the first to appear and the last to go. Marked changes may be found in the fluid long before any signs or symptoms develop. He feels that even an isolated globulin increase is highly suggestive of syphilitic meningeal involvement.

Fordyce speaks of the colloidal gold test in the diagnosis and prognosis of syphilis of the central nervous system. He insists that the fate of the syphilitic individual depends largely on the early diagnosis of his infection and the intensity with which the treatment is carried out in the first six months. It is in the accomplishment of this purpose that the modern aids to diagnosis have rendered the practitioner invaluable service. Fordyce directs attention to the fact that the "tabetic syndrome may be simulated by the multiple neuritis of diabetes or alcoholism, and the real nature of the trouble revealed only by the spinal fluid analysis and the blood test. On the other hand, patients with syphilitic involvement of the central nervous system and suffering from obscure pains, febrile attacks, irritability, gastric and rectal crises, memory failure, etc., are often treated for years for neurasthenia, rheumatism, neuritis, surgical affections, and various other conditions." In the light of recent investigations, no analysis of spinal fluid is complete unless the Lange test be done. As a rule it parallels the other findings, but its greatest value is in distinguishing between paresis and the conditions which resemble it.

THE TRANSPLANTATION OF FREE FLAPS OF FAT.

KANAVEL (*Surgery, Gynecology, and Obstetrics,* August, 1916) records his experience with this procedure in attempts to prevent contractures and adhesions about tendons, nerves, blood-vessels, and joints, to favor repair and lessen deformity. The fat was usually taken from the abdominal wall; in a few instances, when the fascia lata was also desired, from the thigh. The flaps varied from one-quarter to one inch in thickness.

Four cases were treated successfully for the mobilization of old scars.

In four cases transplants were used in an effort to prevent edema following extensive dissections about blood-vessels. Three of these were after breast amputations, and the results were not satisfactory, the flaps coming away either in one piece or by a process of liquefaction necrosis. In the fourth case, in which the transplant was inserted in the inguinal region, healing took place by first intention, and the patient was well one year later.

Transplantations of fat about tendons and nerves were uniformly successful.

Two cases of transplantation into cavity left after the resection of tuberculous joints, the seats of mixed infections, were of doubtful value. One case (wrist) discharged for eight months, and then healed with 30-degree motion; the other had not healed eight months after operation, at the time of writing. The author has not used the method in operations on cases in which sinuses were not present.

In regard to the value of the transplantation of fat to maintain movement in joints after operation for ankylosis (of wrist) Kanavel comes to the following conclusion: "Where the ankylosis has been little complicated the results have been satisfactory, but as time has gone by some absorption of the fat is evident, so that from my observation if the joint resected were adjacent to a muscle-flap, this would seem to be preferable. If, however, the joint does not have such contiguous tissue, fat can be transplanted with assurance that it will not be extruded, and will give a fairly satisfactory result. On the other hand, if the ankylosis is complicated with scar-tissue contraction of the tissues about the joint, the result is naturally affected, but in none of my cases has the ankylosis recurred, and in all but one the range of motion . . . was from 25 to 45 degrees, entirely satisfactory under the circumstances. In the case spoken of (as presenting an unsatis-

factory result) only one row of carpal bones was removed. In all the other cases both rows of bones were removed."

Fat may be transplanted into the skull for the purpose of preventing the formation of adhesions with the assurance that it will not be a cause of irritation; the epileptics on whom the author operated, so far as observed, had not been cured.

In attempting to fill in bony defects the author failed in a case of tuberculous and in one of non-tuberculous osteomyelitis, but was successful in a case of osteitis fibrosa cystica.

The remaining cases in which fat transplantation was used were contractures of the hand following extensive infections. In some of these the structures were identified with the utmost difficulty, so that the operations were long and tedious, but in all the fat, placed between the tendons and the bones, between the tendons and the skin, and between the individual tendons, so far as possible without the use of retaining sutures, lived, and the usefulness of the member was increased.

TREATMENT OF INFECTED WOUNDS BY PHYSIOLOGICAL METHODS.

WRIGHT (*Lancet*, June 17, 1916) explains in great detail the action of hypertonic solutions of sodium chloride when applied to infected wounds.

The treatment of infected wounds divides itself into three therapeutic procedures:

(*a*) The freeing of the depths of the wound from the infecting organisms, the eradication of the infiltration in the walls of the wound and of sloughs from its surface, and the inhibition of the growth of microörganisms in the cavity of the wound itself. It is also essential at this time to prevent the ingress of bacteria and septic material into the lymphatics and blood.

(*b*) The elimination of the surface infection.

(*c*) The promotion of the processes of complete repair.

The majority of the antiseptics in common use lose their antiseptic power as soon as they come in contact with albumin. Their penetrative power is therefore very small. It can be demonstrated that none of our ordinary antiseptics kill organisms enveloped in dead or living tissues, or in serous or purulent discharges; and that none diffuse into the walls of recesses of the wound.

In proper drainage there should be an outflow from the infected tissues to the external surface or the surface of a wound cavity; and secondly, where a wound cavity exists there should be a flow from that cavity to the exterior.

As ordinarily conducted, by simple incision, only the second of these requirements is met, for only when the tissues are edematous will there be a flow of lymph under such circumstances. In tissues of normal density nothing like adequate effusion will be obtained, the flow here being rapidly arrested by clotting and desiccation; and, where we are dealing with densely infiltrated tissues, incisions may fail to furnish even as much as a drop of exudation.

Saline dressings supply a means of invoking, in the infected wound, certain requisite physiological reactions. By their aid we can, while at the same time inhibiting bacterial growth, drain the tissues, resolve infiltrations, and promote the separation of sloughs—besides giving other assistance.

A concentrated salt solution will attract water; and, except in those cases in which a membrane impermeable to albumin is interposed, the outflowing current of water will carry with it the whole of the protein substances which it holds in solution. This means that hypertonic salt solution applied to tissues lying bare in the wound, or to granulating surfaces, will act as a lymphagogue drawing out from the infected tissues lymph which has spent all its antibacterial energy, and drawing into the tissues from the blood stream lymph inimical to microbic growth.

Brought into direct application upon the leucocytes a hypertonic solution (what is

in view here is a solution containing 5-per-cent sodium chloride) will disintegrate these cells, setting free the tryptic ferment they contain. Such hypertonic salt solution will also exert a number of inhibitory actions.

It will inhibit the action of the tryptic ferment set free in the wounds.

It will inhibit coagulation, and so prevent the sealing up of the orifices through which lymph pours into the wound.

It will inhibit leucocytic emigration into and prevent phagocytosis in the cavity of the wound.

It will inhibit microbic growth.

Normal solutions of sodium chloride exercise a positive chemotactic effect on white blood-corpuscles. In moderately dilute solutions (8.5 per cent) salt does not interfere with the activity of trypsin, nor does it inhibit the coagulation of blood or lymph, phagocytosis, or microbic growth.

The first requirement when we have an infected, lymph-bound, infiltrated, and sloughing wound will be to get rid of the coating of scab and fibrin adhering to its surface, and set the lymph-flow going, to resolve the infiltration and to promote the separation of the sloughs. This involves two successive operations. In the first we make use of the hypertonic solution undiluted; in the second we turn its dilution to profit.

At first the striking part will be the outpouring of lymph. But there will be at the same time, (*a*) in the depth of the tissues, (*b*) on the surface, and (*c*) in the cavity of the wound, other reactions which cannot be directly followed by the eye.

(*a*) In the depth of the tissues there will be substituted for the spent lymph which has been extracted lymph freshly drawn from the blood stream. This means that there will be substituted for a lymph which is favorable for the growth of all microbes indiscriminately a lymph which will stop the growth of serosaprophytic bacteria, and imperfect serophytes (such as the gas-gangrene bacillus); and at the same time seriously impede the growth of the serophytic bacteria, above all the growth of the streptococcus.

Further, the microbes in the tissues, which when immersed in the spent lymph were insusceptible, will, when immersed in the fresh lymph, become susceptible to phagocytosis. And in the induction of phagocytosis in the interior of the tissues the imbibed salt will, we may take it, play a contributory rôle. For we have seen that salt, appropriately diluted, stimulates leucocytic emigration.

(*b*) In the more superficial regions of the walls of the wound and the adhering sloughs the hypertonic salt solution will break down the leucocytes and set free tryptic ferment—ferment which will not come into action so long as the concentration of the salt is maintained. The coagulation of the lymph on the face of the wound will also be inhibited.

(*c*) In the cavity of the wound microbic growth will at the outset be completely arrested by the hypertonic salt, and it will, after the lymph has begun to pour out, be inhibited to different degrees according to circumstances by the combination of salt and antitryptic exudation. So long as the salt solution is maintained at full strength, both emigration into and phagocytosis in the cavity of the wound will be inhibited.

As soon as the hypertonic solution in the cavity of the wound has been sufficiently diluted by outflowing lymph, the salt diffuses out into the infiltrated walls of the wound and the sloughs; and with this the tryptic ferment previously set free comes into action, and goes about its work of "cleansing digestion." At this time the discharge becomes purulent, an indication for the redressing of the wound.

In applying hypertonic salt solution the following points must be borne in mind:

For the achievement of adequate lymphagogic effect considerable quantities of the solution must be used. The dressings ought to come directly out of the hot solution, and be applied dripping wet.

In order that a "cleansing digestion" may follow upon the lymphagogic action the

amount of salt employed must be kept within such limits as will allow its being within a reasonable period diluted by the outflowing lymph—in other words, too much of the solution must not be used, nor too concentrated a solution; nor must it be supplemented with large packs of saturated solution, nor with salt tabloids.

In order to anticipate that pullulation of microbes which will supervene when the exudate becomes tryptic the wound should be redressed as soon as the discharge begins to be purulent.

Wounds which lie wide open should be packed with gauze wet with 5-per-cent saline, and covered with some impermeable tissue. When redressed all pus must be removed before the strong salt solution is again applied. Where the wound is pocketed or tends to flap together, the best procedure is to apply a bath of warm 5-per-cent saline. Should this be impossible the wound should be irrigated at intervals. Neither the bath nor the irrigation should be continuous, intervals being allowed for "digestive cleansing." Where there is a long tubular wound, this should be syringed out with the 5-per-cent solution; a split or fenestrated tube containing a wick of gauze wet with a saturated solution of salt should then be inserted.

When gas-gangrene, streptococcic cellulitis, or other acute tissue infection is present, when there is danger of secondary hemorrhage from an infectious process near an artery, and it is therefore not wise to permit tryptic digestion, and when a joint is infected, the application of the 5-per-cent saline should be made as nearly continuous as possible, either by frequent redressing, injection of the solution through tubes inserted down to the joint surface, or by the application of compresses wet with saturated saline solution over the wound.

Redressing is called for when there is a purulent discharge, and still more urgently when the wound is "lymph-bound" and the serum ceases to flow.

All bruising, and all movement of the infected parts, both passive and active, are to be avoided to prevent the diffusion of septic elements by the lymph or blood.

Hypertonic salt is not to be used where there is oozing from an operative wound, as an amputation stump, or where the granulations are edematous, or where the granulations are a bright-red and bleed at the least touch, or after the infiltration has disappeared. Physiological saline is then indicated. This tends, by drawing the leucocytes to the surface, to destroy the serophytic organisms.

Secondary suture of the wound may be safely performed when favorable bacteriological and anatomical conditions alike exist. The bacteriological conditions may be pronounced favorable if a microscopic examination of the fluid from the depth of the wound and drawn out by a "lymph leech" is negative; or failing this, clinical evidence may show the probability of the deep infection having been gotten rid of, or when stained impression preparations made from the wound surface show that there are large numbers of well-conditioned polynuclear leucoeytes and a complete absence of microbes, or only here and there a stray bacterium.

The anatomical conditions are favorable when one can without undercutting bring together the skin edges without putting too great strain on the sutures, or leaving any hollow spaces beneath. The operation should follow immediately upon the bacteriological examinations.

THE SLIDING GRAFT AND THE KANGAROO SUTURE IN FRESH FRACTURES.

LATHROP (*Annals of Surgery*, July, 1916) states that if there be deformity or overriding, either a sliding graft is put in, taken from an upper fragment, as advised by Albee, and fastened with kangaroo tendon—or the ends are put in position by means of clamps, and then fastened by two holes drilled through each fragment in such direction that, when the kangaroo tendons are passed through, they will cross each

other in the medullary canal, and when tied will hold the ends of the bone in apposition, without slipping.

In the case of an overlapping, or oblique fracture, the holes are drilled straight through, so that the gut is passed in from one side to the other, then back, and tied on the same side—a mattress suture. Two of these are sufficient. The wound is then carefully sutured, and after applying the dressings the limb is put up in plaster of Paris. This method applies chiefly to the tibia, humerus, radius, and ulna, but Lathrop has used it in several fractures of the middle third of femur.

Fractures of the radius and ulna, which are often so troublesome, are quickly repaired by a single kangaroo tendon passed through a small drill hole in each fragment, and the results are most satisfactory.

A remarkable thing about the autogenous graft is its tendency to live and grow in the presence of infection and pus. In one case after replacing (twelve days from the first insertion), and fastening with kangaroo tendon, the leg continued to drain, but the graft grew in place, and the bones united.

Lathrop has operated on 41 cases out of 103, showing a fair conservatism. In the light of his present knowledge he would have done more sutures, and thus would he have treated all of the compound fractures of the lower leg.

In view of the compensation law, now in effect, there is no doubt but what more will be demanded in the way of shorter periods of disability, and if it is shown that the cases operated upon by the Albee technique do better and are restored quicker than by other means, then the choice will be for that method, but always under strictest asepsis, and by those qualified to do it and who are in daily touch with operative technique.

In summing up, Lathrop states that from his experience in several hundred cases, during the past few years, and having used wires, plates, nails, and later the Albee methods, the latter offers by far the best means by which good results may be gotten, without resort to any foreign body. The simple method of kangaroo suture is of vast benefit in cases of fresh, overlapping, or obstinate fractures of arm, forearm, or leg; even in the shaft of the femur it can be used with success; while, if desired, the sliding inlay graft offers a method whereby success will be gotten in the majority of cases in which ordinary reduction is not satisfactory.

The *x*-ray should always be used, an anesthetic should always be given, and attempts to reduce without operation should be made; and, these failing, the open treatment by graft, or suture, is indicated.

Compound fractures can nearly always be placed in apposition and held by the kangaroo tendon. Plaster of Paris is the best means of immobilization, and should be applied smoothly, with care to pad the parts.

THE TREATMENT OF PARESIS BY INTRAVENTRICULAR INJECTIONS OF DIARSENOLIZED SERUM.

KNAPP (*Boston Medical and Surgical Journal,* July 6, 1916) contributes a paper upon this subject. He speaks, first, in commendation of the Swift-Ellis method, stating that in syphilitic affections of the central nervous system intraspinal injections of salvarsanized serum have yielded results such as in no other way has he ever obtained with such constancy. This belief is based on a study of about 500 injections on over a hundred patients, with pretty constant benefits, with no bad effects other than a temporary increase of pain, excepting for one sudden death. The most striking benefits were in the spinal cases. He has seen tabetics, who could stand only with the support of two nurses when treatment was first begun, who after a few injections would walk several miles with an approximately normal gait, and paraplegics leaving the hospital walking normally and with complete control of the bladder and with normal sensibility to reflexes after three injections. Such results he has not seen in cerebral cases.

Marinesco, Cotton, Hammond and others

are quoted as having given intraventricular injections to a number of patients with very considerable benefit and no bad results.

The operation is comparatively simple. A small trephine hole about half an inch in diameter is made just in front of the bregma and an inch to the right of the median line. The dura is then incised so as to give an opportunity to select a spot free from large cortical vessels, and a blunt-pointed cannula is inserted downward and backward about six to seven centimeters into the lateral ventricle. Hammond has usually found the dura very thick and opaque, but such has not been Knapp's experience. Ten to twenty cubic centimeters of cerebrospinal fluid is then slowly drained off and an equal amount of serum, containing 0.6 to 0.8 milligramme of salvarsan, neosalvarsan, or diarsenol, is allowed to flow in very slowly and gently. The wound is closed in the usual way. Subsequent injections are made directly through the scalp.

The first reported case was a coal-heaver of low mentality, who seemed to be somewhat bettered by two injections each of 0.6 mg. The second was a drug clerk who was noted as being "brighter" after the second injection. The return of the knee-jerk and reaction of the pupils is noted.

PRIMARY CARCINOMA OF THE URETHRA, RETENTION OF URINE FROM OBSTRUCTION, RESTORATION OF FUNCTION BY RADIUM.

SHOEMAKER (*Surgery, Gynecology, and Obstetrics,* June, 1916) quotes as follows a case reported by Lehueu and Cheron: A woman, aged twenty-six; pavement epithelioma, at first involving the urethra, which was destroyed, producing incontinence; extension to vagina. Radium applications by Cheron with disappearance of growth. Two and a half years later, death under operation for implantation of ureters into bowel. Autopsy: no microscopical malignancy.

The author then relates his own experience: Mrs. W., multipara, a full-blooded Virginia negress, aged fifty years, applied at the Presbyterian Hospital because of overdistention of the urinary bladder with complete retention. Beginning about five months before (July, 1915) there had been some difficulty in urination, gradually succeeded by dribbling. For more than a week bladder distention had been extreme, and on admission culminated in inability to pass any urine at all. There had been no bleeding or pain, except that due to the bladder condition.

No ordinary sized catheter could be introduced, owing to a nodular infiltration in and around the urethral canal. The urethra felt through the vagina like a hard fixed ridge of the size of a lead-pencil, extending from the meatus back nearly to the base of the bladder. The orifice was retracted, its edges hard, irregular, nodular, and ridge-like. The vaginal surfaces were normal in color; the surfaces of the urethral mucous membrane were reddish but not ulcerating. There was no involvement of the cervix or uterus; the vagina and vestibule showing only senile changes, except close to the urethral canal. There was no tumor. A No. 6 ureteral catheter was passed with some difficulty. It was tied in and the bladder thus gradually drained. In the first twenty-four hours, 173 ounces, or nearly 11 pints, of urine were thus obtained and some was lost.

Bladder drainage and rest in bed caused sufficient subsidence of swelling to enable a No. 12 soft catheter to be passed after some days, but retention persisted.

Surgery was inadvisable, as the removal of the entire urethra up to the neck of the bladder would have been necessary, with resulting incontinence. Radium was therefore advised. Dr. William S. Newcomet carried out this portion of the treatment, while the bladder paralysis and cystitis resulting from overdistention were being treated in Dr. Shoemaker's service at the Presbyterian Hospital.

The patient was transported to and fro, from time to time, to the Department for

Radiotherapy of the Jefferson Hospital, where an applicator of proper size and efficiency was to be found. Between December 14, 1915, and January 4, 1916, nine applications in all were made, of three hours each. The quantity used was 20 milligrammes of radium element.

TREATMENT OF WOUND INFECTIONS.

MORGAN (*Proceedings of the Royal Society of Medicine,* June, 1916) alludes to Wright's advocacy of giving up treatment by antiseptics for treatment by salt solutions. Morgan is not in accord with Wright concerning the interpretation of his laboratory work. His method of investigation was somewhat different and seems distinctly more in accordance with clinical conditions. He finds that the ultimate strength of the antiseptic being the same, the greater the proportion of pus the less the inhibition of growth. Where pus is present in the proportion of 4 parts to 1 of antiseptic, organisms may grow freely when the following are the antiseptics used: Mercuric salts 1 in 200, carbolic acid 1 in 60, iodine 1 in 200, boracic acid 1 in 20, chloramine 1 in 20, hypochlorous solution 1 in 200 available chlorine. Organisms also grow when salt solution 20 per cent is used. Since organisms grow in pus in which antiseptics are present in the strengths indicated above, it is utterly unreasonable to expect any of them to diffuse into the tissues to such an extent as to give a strength sufficient to inhibit the growth of microbes, still less to kill them. The pyogenic organisms are, as regards their growth in pus, among the least affected by the ordinary antiseptics. It is plain that in appraising the value of an antiseptic the purpose for which it is used must be taken into account. For instance, for washing out of a wound, when the antiseptic would be in great excess, hypochlorous solutions are very potent and carbolic acid is comparatively weak. On the other hand, for an application in a dressing, when the pus would tend to be in excess, hypochlorous solutions are practically useless, whilst carbolic acid, although it has the disadvantage of interfering with the activity of the leucocytes, is fairly efficient.

Again, it becomes clear that, upon the evidence the experiments supply, antiseptics cannot do as much as is claimed for them. They certainly cannot sterilize the tissues subjacent to the surface of a wound, and indeed cannot be depended upon to sterilize an accessible surface, although they kill many of the organisms on it. Their use, therefore, depends on whether there is any advantage in this. It would seem that there is, for it can hardly be possible that the depth and intensity of the tissue infection are independent of the proportion and virulence of the organisms in the surface pus. If, therefore, these can be reduced, even temporarily, without at the same time unduly interfering with physiological processes, it is an important gain. This, which is in fact the most important object in dressing wounds, can be done by means of antiseptics, and herein lies their rôle in antiseptic treatment. If we expect more from the antiseptics at present available, we shall be disappointed.

SOME STUDIES ON THE ANATOMY OF THE RENAL PELVIS.

EISENDRATH (*Urologic and Cutaneous Review,* June, 1916) notes that the subject of his paper is one of considerable importance, not only from the anatomical standpoint, but from the clinical as well. The wounding of an anomalous vessel in the performance of a pyelotomy has occasioned hemorrhage so severe as to necessitate nephrectomy.

In addition to the "high" type of retrorenal artery usually described, in which this artery after coming off from the renal trunk goes directly to the posterior aspect of the pelvis and then passes along at just about the junction of the renal pelvis and the parenchyma of the kidney, there are middle and low types, which occur in a considerable proportion of cases. In the middle type the artery passes directly across the middle

of the pelvis, and as it lies here surrounded by fat it is very likely to be injured in operative procedures on the pelvis. In the low type the artery crosses the junction of the pelvis and ureter.

Anomalies are also encountered in the course of the renal veins. Typically these all lie in front of the pelvis, but occasionally all lie behind, or branches of equal size lie both in front and behind.

In the 68 kidneys in which the author dissected the arteries, the high type was found in 56 cases, or 82 per cent; the middle type in 4 cases, or 6 per cent; and the low type in 1.5 per cent of cases. Middle and low types were combined in 4.5 per cent, high and low in 3 per cent; the artery came directly from the aorta in 1.5 per cent, and from an accessory artery in 1.5 per cent. All of the renal veins were retropelvic in 6 cases, or over 9 per cent; in one case the retropelvic vein went directly to the vena cava.

As to the type of pelvis, the author found that the ampullary type usually described occurs in 87.8 per cent of cases (157 kidneys examined). The bifid type was found in 10 per cent, and the trifid in 2 per cent.

THE COMPLUETIC REACTION IN AMENTIA.

Stephens (*Proceedings of the Royal Society of Medicine*, June, 1916) explains the title of his paper to the effect that his coined word "compluetic" is from the two words complement and luetic, and that by it he means the reaction commonly and to an extent unjustly, since the Bordet-Gengou are neglected, called the Wassermann reaction. He gives a summary of his technique, which seems excellent. He applied the test, and found in one hundred cases examined that 42 gave a positive reaction. Of the 42, 22 were definitely positive and 20 were weakly positive. The disease is regarded as congenital whether the patients exhibited any of the stigmata of syphilis. Nor did a study of the records of the parental and family histories adduce evidence of the disease in any of the parents or their forebears. The compluetic reaction, being the only reliable evidence in forty-two of these cases of their being syphilitic at all, was also the conclusive testimony to the presence of the disease.

Allusion is made to the cases of "infantilism," free from all obvious syphilitic stigmata, in which Mott has seen in both ovaries and testis myriad colonies of the spirochæta pallida. Similarly retarded develpoment of the other members of the endocrinic glands may be found to be due to the same cause, and how closely the endocrinic system is associated with the central nervous system is daily becoming more manifest. Broadly considered, amentia may, perhaps, be interpreted as a symptom-complex of arrested brain development, such retardation being due either to an inherent inability on the part of the brain cells to grow and evolve, or to the effects of some factor inimical to their perfect fulfilment, such a factor being either traumatic, or toxic, or inflammatory in its appearance.

In none of these forty-two cases giving a positive compluetic reaction did the syphilitic virus acting alone appear to produce the amentia. In every instance it would seem that the virus was associated with and acted upon inherently defective, diseased and degenerated, or damaged nervous tissues. And this, perhaps, is only to be expected, for, as will be recollected, the children of syphilitic parents need not necessarily be aments, although, as is also known, a minority of congenital syphilitics, if untreated, or ill-treated, are liable to become the victims of various nervous lesions under mental or physical strain and stress; and this is especially so—in fact, it may even be said to be only so—in those patients in whom the central nervous system is in some way defective. Given a healthy nervous system, congenital syphilis, as is proved by common medical experience, will not produce amentia. On the other hand it is quite possible, and even reasonable, to suppose that given an exceedingly virulent

neurotoxic type of syphilis *in utero* the healthiest nervous system would be likely to fall a victim to the virus. Between these two extremes the various grades of syphilitic amentia may be found.

The degrees of amentia are grouped as follows: idiots, imbeciles, feeble-minded, and moral imbeciles. Of all the 100 patients examined by Stephens, all were either idiots or imbeciles. Although positive reaction was found in 42 cases, in only 22 of these was a reaction to be regarded as strongly positive. If syphilis be a dominant or even an actively contributing cause of idiocy or imbecility it is highly important that this should be recognized, since it constitutes further argument for vigorous treatment of the potentially or actively pregnant woman.

Shuttleworth quotes a table of percentages obtained by fourteen different observers which varies from 1.5 to 60, in which positive reactions to the Wassermann test have been recorded in the blood of congenital cases of mental defect.

Collie has shown that over 9 per cent of males apparently healthy applying for employment in various occupations such as tramway, fire brigade, etc., gave a positive Wassermann reaction.

Plaut's observations tend to show that the reaction disappears with age. This was not evidenced in the report of Stephens.

In this connection Gordon's contribution (*Archives of Pediatrics,* 1916, xxxiii, 273) is interesting. He notes in a series of 78 cases comprising imbeciles, idiots and feeble-minded, with epilepsy, petit mal, headaches, and those without functional or organic disorders, the Wassermann test showed that 50 per cent presented a positive reaction. He notes that the mental impairment caused by syphilis is at times irremediable; it also causes mental deficiency, which is amenable to improvement. The detection of such recoverable cases is of paramount value. He advises that where a positive Wassermann is procured the treatment should be vigorous and prolonged. He records distinct improvement in feeble-minded children; diminution or cessation of epileptic attacks in some, and special betterment in the case of petit mal. The most striking is the improvement in the feeble-minded with no functional disturbance.

INDICATIONS FOR AND RESULTS OF CEREBRAL AND CEREBELLAR DECOMPRESSION IN ACUTE AND CHRONIC BRAIN DISEASE.

Elsberg (*Surgery, Gynecology, and Obstetrics,* August, 1916) states that the first effect of a local increase of pressure is that the brain is pushed in another direction. Thus in supratentorial new growths, the hemisphere is pushed toward or away from the median line. As a result, the falx cerebri may bulge toward the other side, and the tentorium become convex toward the cerebellum. The increased pressure upon the inner surface of the skull may be followed by absorption of bone in one or another location. A certain amount of pressure is transmitted below the falx to the hemisphere of the other side; its amount will depend upon the location of the growth. From the same cause, cerebrospinal fluid is forced out of the cranial chamber into the spinal canal and along the sheaths of the cranial and spinal nerves. The stretching of the dura probably causes the headache, and possibly the nausea and vomiting; the forcing of fluid into the sheaths of the optic nerves is followed by papilloedema and choking of the disks, while the pressure upon the brain itself is followed by slowing of the pulse and respiration and interference with function. Unless the cerebral ventricles become distended by an obstruction of the iter the fluid is present in excess in the spinal canal.

If a local increase of pressure occurs underneath the tentorium, the latter is bulged upward, and secondarily the intracranial pressure is raised by the stagnation of fluid in the ventricles. The free communication between the ventricles and the subdural spaces of the brain and cord is a necessity for the proper functionating of the brain; when the cerebrospinal fluid can

no longer flow from the lateral ventricles through the Sylvian aqueduct to the fourth ventricle and the spinal canal, symptoms of increased intracranial pressure are certain to appear.

If the increase of intracranial pressure is due to a dilatation of the ventricles, from compression of or adhesions in the iter (obstructive hydrocephalus), from an oversecretion of cerebrospinal fluid or diminished absorption from the subarachnoid space (non-obstructive hydrocephalus), then the pressure will be exerted upon all parts of the brain; although some parts, either on account of a more exposed position or greater delicacy of structure or greater sensitiveness, are more easily affected than others.

The symptoms of increased intracranial pressure are then either local, due to a direct effect upon parts of the brain whose functions are interfered with, or general. Local symptoms are, however, often due to general causes and general symptoms are often caused by a strictly local process. Certain focal symptoms such as abducens palsy and nystagmus are often observed in a generalized increase of tension, and the frequency of cerebellar symptoms in internal hydrocephalus is well known.

A localized expanding lesion such as a tumor or hemorrhage may first cause focal symptoms, followed by symptoms of pressure on more distant parts of the brain, and finally general symptoms such as loss of consciousness, headache, papilloedema, etc. The progression of symptoms may not occur in such a regular order. The general may appear long before the localizing symptoms, and it is often necessary to operate for the relief of the general symptoms before any localizing ones have shown themselves.

The means at our command for diminishing increased intracranial pressure consists either in the removal of fluid by spinal or ventricular puncture (including puncture of the corpus callosum), or the making of an opening in the skull to give the brain a chance to bulge out through the opening, thus making what really amounts to an enlargement of the cranial cavity.

If the increase of intracranial pressure is due in part, even if only secondarily, to an increase of fluid within the ventricles, the repeated removal of the fluid by lumbar puncture may be a valuable decompressive method. To have any real effect, it is necessary that the communication between the brain cavities and the spinal subdural space be wide open. If this is the case, the removal of 20 to 50 cubic centimeters of fluid at regular intervals will relieve the compression of the brain to the extent that the compression was due to the fluid. The same can be accomplished by repeated ventricular punctures in infants and young children. Statistics have shown that fully 75 per cent of tumors of the brain are accompanied by more or less internal hydrocephalus, so that in irremovable or unlocalized new-growths, except those in the posterior cranial fossa, some relief of the compressed brain will follow the withdrawal of fluid from the spinal canal. Where the increase of pressure is due to an oversecretion of fluid or a diminished absorption from the subarachnoid space, repeated lumbar punctures may be of benefit. If the distention of the ventricles is due to an obstruction of the aqueduct of Sylvius by adhesions, the usual form of primary obstructive hydrocephalus, a new communication may be made between the ventricles and the cerebral subarachnoid space by means of puncture of the corpus callosum. This is a most valuable decompressive operation in all forms of obstructive hydrocephalus, whether due to new growth or other cause. The investigations of Dandy and Blackfan have shown, however, that it is always necessary to test the absorptive power of the subarachnoid space by means of intraspinal or intracranial injections of neutral phenolsulphonephthalein. If the absorption from the subarachnoid space is far below the normal, there is no use of performing a callosal puncture because the fluid cannot be absorbed, and instead of an internal hydrocephalus there

would result a combined internal and external hydrocephalus with the same total amount of pressure upon the brain tissue.

Puncture of the corpus callosum is a rational and valuable decompressive method in brain tumors with internal hydrocephalus; it may be done alone or in conjunction with a decompressive craniotomy.

The best decompression will be the one in which the brain tissue is dragged upon or pushed in such a way that the smallest number of nerve tracts are interfered with. The author has examined the brains of a number of patients who have died from irremovable brain tumor and on whom a palliative subtemporal decompression had been done. In supratentorial lesions there was often considerable internal hydrocephalus, and the distended lateral ventricle of the side operated on was dragged upon or distorted. Much harm was done to important nerve tracts by this unnecessary distortion of the brain, and just as much space would often have been gained, and mechanically a more correct decompression have been accomplished, by means of an autodrainage of the ventricles. Motor-tract symptoms are apt to be made worse in a left or right mid-brain tumor by a subtemporal decompression on the right side. The symptoms of a tumor which lies medianward to the internal capsule may be exaggerated by a subtemporal decompression. In these two classes of cases it is advisable to do a bilateral decompression, the right side being done first and the ventricle punctured, so as to avoid too great a prolapse of the left temporal lobe and a resulting aphasia.

The incision of the capsule of a large irremovable tumor in the cerebellopontine angle and the curetting away of part of the tumor after a large bilateral suboccipital craniotomy has been done is also a decompression. These tumors in the cerebellopontine angle are benign in character, are encapsulated, and grow very slowly. Small tumors can be removed with relatively small danger. Many of the growths are very large when they finally come to operation and markedly compress the pons and medulla, so that even with the greatest care considerable trauma to those important structures is bound to occur. It is therefore preferable to relieve the pressure by incising the capsule of the tumor and scraping out part of the growth, and this will often be followed by complete disappearance of the symptoms. If the symptoms should recur, the procedure can be repeated after a few years.

In removable growths there is often an advantage in diminishing extreme intracranial pressure by a ventricular puncture, a puncture of the corpus callosum, or a subtemporal decompression before the actual removal of the growth is attempted.

It is rarely possible to revive a patient who is in deep coma from a brain tumor by any kind of an operation unless the coma is due to the distention of the ventricles. Therefore, if the neurologist sees a patient with a brain tumor in coma, he should recommend a rapid aspiration of the ventricle or a puncture of the corpus callosum, perhaps with a subtemporal decompression. If there is not a decided increase of fluid in the ventricles, the chances for return to consciousness are slight.

Whether a decompressive operation can really relieve a spastic paralysis (as occurs in Little's disease or in posthemiplegic spasticity), unless an actual cystic collection of fluid is found, is still an open question. Sharpe claims to have obtained some good results from decompression in Little's disease, and he has shown a number of remarkable cases. If further experience will substantiate the results thus far obtained, a great advance in the treatment of Little's disease has been made by Sharpe.

The indications for operative interference in fracture of the skull should be based upon the diagnosis of the condition present in the individual case, and upon the question whether there is a stationary or an advancing lesion. The fact that the patient is drowsy or in a stupor is not of itself an indication for operation, for an individual with so-called cerebral concussion without

bony fracture or gross injury to the brain may remain in a stuporous condition for many hours. It is a different matter if the stupor becomes deeper and if more evidence of increased intracranial pressure appears.

If the symptoms show a tendency to progress and are well localized to one part of the brain, the surgeon may be in doubt whether there is increasing extradural or intradural hemorrhage. An exploratory puncture of the skull may then have to be done, and it can often be accomplished under local anesthesia.

Patients in whom few symptoms are present at first, but who develop after a few days signs of increased intracranial pressure, papilloedema, drowsiness, respiratory disturbances, and slow pulse, are suffering from a slow venous hemorrhage or from edema of contused brain tissue. If the signs point to a localization of the compression of the brain, an exploratory trephining must be done over that region; otherwise a subtemporal decompression is indicated.

Patients with the signs of fracture of the base, and of increasing intracranial pressure, should have a subtemporal decompression performed.

THYMUS DEATH.

Under this title FALLS (*Surgery, Gynecology, and Obstetrics,* June, 1916) writes on a subject which is always of vivid interest to both the internist and the surgeon. The gland develops as a paired organ from the ventral part of the third bronchial cleft. These unite early in the embryological development, and at birth the thymus lies in the superior and anterior mediastinum, extending downward as far as the fourth costal cartilage, and lying on the surface of the pericardium and superficial to the innominate veins. It varies greatly in size, shape, and position. Experimental work seems to show that this gland is intimately concerned in calcium metabolism, this effect being particularly marked in the early weeks of life.

Koenig removed the thymus from a nine months old child, which subsequently became rigid. Thymus death may be grouped in two great classes, to wit: under status thymicus, and under status thymicolymphaticus, in which the thymus gland is greatly hyperplastic and gives clinical and anatomical evidence of compression of the great vessels, nerves, and trachea. It has apparently been shown that in certain cases compression of the great vessels is an important factor in the cause of death. Status thymicolymphaticus implies an enlarged thymus associated with a general enlargement of the lymphatic and frequently of the ductless tissues. Another very important finding in these conditions, according to Wiesel and Hedinger, is an associated hyperplasia of the chromaffin tissue of the body. There is also an associated narrowing of the vascular system in these cases. There is evidence to show that the thymus plays an important part in Graves's disease, and may in certain cases even play the title rôle. The result of feeding tadpoles on thymus is interesting and suggestive. They grow enormously and do not change form. Those fed on thyroid, however, change form very rapidly, but do not grow. Falta states that the thymus has supernormal parenchymal value in many cases of Basedow's disease, also in acromegaly, in hypophysial dystrophy, in myxedema, in eunuchism, etc. It is a familial disease characterized by the death of the children in a family with the classical symptom-complex of hyperplasia of the thymus.

The symptoms in this condition are those referable to an enlarged thymus causing pressure upon the mediastinal structures with or without the associated changes found in status lymphaticus, according to whether the condition is a status lymphaticus, with especially large thymus, or a pure status thymicus.

The onset varies in different cases. Symptoms may be present at or shortly after birth, and usually appear during the first year. They may appear suddenly in a previously apparently normal child, or

gradually and with increasing severity. The cases of sudden death without any premonitory symptoms are usually cases of status lymphaticus plus thymus hyperplasia.

The symptoms referable to the enlarged gland are: Dyspnea, either constant or paroxysmal, usually aggravated by exertion, such as crying, fits of anger, sudden retraction of the head, or in association with attacks of acute infectious diseases, especially diphtheria. Cyanosis, which is usually associated with the dyspnea and is likewise paroxysmal, and is partly due to the narrowing of the air-passages, pressure on the vagus nerves and on the heart and great vessels; this may be the only symptom giving rise to the "forme cyanotique" of Marfan. Tumor appearing in the suprasternal notch on strong expiration and disappearing on inspiration. Slow pulse in some cases, probably due to pressure stimulation of the vagus nerve. Changes in the voice, which vary from a slight and transient hoarseness to a complete aphonia, due in some cases to pressure on the trachea and larynx, and in others to pressure on the recurrent laryngeal nerves. Dysphagia may in extreme cases completely prevent swallowing.

Inspiration and expiration may be prolonged and deepened, and auscultatory findings of a capillary bronchitis are common. which may go on to a bronchopneumonia, especially in the late stages of the fatal cases. Percussion may reveal a movable tumor behind the sternum, but results obtained by this method are not very reliable, as pointed out by Park and McGuire. Radiograms may show a shadow in the region of the thymus which blends with that of the upper border of the heart. The gland may be palpated in the suprasternal notch on expiration in some cases.

There may be a lymphocytosis, which is usually of the small mononuclear type and may reach 50 or 60 per cent. Eosinophilia in slight degree (2 to 4 per cent) is noted in some cases. According to Qiesel this finding is absent in the cases of pure status thymicus.

In the cases associated with the typical status lymphaticus, the above symptoms may be displayed, but usually are present in less degree, and the predominant feature of these cases is the picture of status lymphaticus with the enlargement of the lymphatic structures of the whole body, pasty skin, adiposity, and associated changes in the chromaffin system. These are the cases particularly in which sudden death occurs without prodromes.

Of special interest is the warning of Klose and others against prolonged exposure of the thymic region in young children to the *x*-ray because of the destruction of thymic tissue by the irradiation.

The treatment of the condition is removal of part of the gland in the cases in which pressure causing tracheostenosis threatens life. This can be accomplished by entering the thorax above the suprasternal notch, under local or general anesthesia, according to the demands of the individual case. Care must be taken not to remove the whole gland in very young children because of the metabolic disturbances engendered, as in the case of Koenig, and as shown by the experimental work of Klose and Vogt.

Irradiation with the *x*-ray has been tried by Friedlander, Mayers, Halstead, Ribideau, Rachford, and with some success. Its use should be restricted to older children and adults for the reasons mentioned above.

No uniform results have been obtained from treating these cases with thyroid extract and thymus tissue. Spontaneous recovery occurs not infrequently even after several attacks of dyspnea extending over years.

Care must be exercised in operating on cases showing evidence of status lymphaticus as well as enlarged thymus, as it is in these cases that sudden death during narcosis so frequently occurs.

Also as illustrated by the case reported, surgeons should keep in mind the possible anomalous position of the mediastinal bloodvessels with a view to avoiding injury to the same with serious consequences.

REVIEWS.

THE PRINCIPLES OF DIAGNOSIS AND TREATMENT IN HEART AFFECTIONS. By Sir James Mackenzie, M.D., F.R.S., F.R.C.P. Oxford University Press, London and New York, 1916. Price $2.50.

The name of Mackenzie is so intimately associated with the study of cardiac disorders that anything that he writes in regard to this subject at once receives the attention of the profession. The contents of this book were prepared as lectures to be delivered to the postgraduate students and workers in the Cardiac Department of the London Hospital, but the outbreak of the great war prevented their delivery. It is hardly necessary to state that Dr. Mackenzie believes not only that a large amount of the information herein contained has been obtained by means of various mechanical aids to diagnosis, but that these aids are essential in many instances for satisfactory treatment.

Some of the most interesting chapters, of which there are twenty-six, deal with Various Forms of Breathlessness; The Objective Signs of Heart Failure; Various Types of Murmurs and Heart Irregularities. There is also one which discusses the always important and interesting problem of Blood-pressure, and it is interesting to note that the author apparently attaches much less importance to the study of blood-pressure than many of his contemporaries. This is illustrated by the subheadings in the chapter dealing with this subject. The first of these subheadings is: "Blood-pressure Records are Used for Purposes They Cannot Fulfil;" the second, "The Research into the Significance of Blood-pressure has Not Been Undertaken by Observers Who have the Appropriate Opportunity." Again, "Up to the Present Blood-pressure Observations have Yielded but Little Information of Real Value." And still another heading is "Blood-pressure Should Never of Itself Form a Basis of an Opinion."

We presume that it is one of the unavoidable results of popularity and success that an investigator and writer comes to the conclusion that it is proper for him to make sweeping assertions in dogmatic phrases. This fault, if it is such, has become increasingly evident in Dr. Mackenzie's more recent contributions to medical literature. Doubtless many false interpretations have been reached from blood-pressure findings, but to speak of blood-pressure in the manner used by Dr. Mackenzie will not increase confidence in the views which he expresses in his writings. He makes one feel that if he is so dogmatic in regard to some matters in which he appears to know less than most of us, he may be in error in regard to the study of cardiac disease.

UNIVERSAL MILITARY EDUCATION AND SERVICE. The Swiss System for the United States. By Lucien Howe, M.D. G. P. Putnam's Sons, New York, 1916.

Dr. Lucien Howe is well known because of the excellent work which he has done toward the prevention of blindness, and he, apparently, has now turned his attention to the cure of that form of blindness in which the individual cannot see the danger which threatens him and the country in which he lives. The author's excuse as a medical man for meddling, to use his term, with military matters is that for many years he has been greatly interested in improving the physique of pupils in schools and colleges, and this led him to the studies of the methods which were employed by foreign powers for the physical betterment of their young men in order that they might be adequately equipped when the days of war arose. In other words, the author has been instigated to prepare this little work as a means of showing how much good military training can do for the physique of the young. Dr. Howe deals, first of all, with the question "Why Should There be any Preparation?" and gives the reasons which answer this question. He then discusses What is Needful in the Way of Preparation, How We Shall Prepare, The Swiss and Australian Systems of Physical Mili-

tary Education, and then goes on to a Consideration of Military Education Already Begun in This Country Outside of the Regular Service. He discusses the Advantages of Universal Military Education to the Nation and to the Individual, and includes a chapter upon Military Education, Not Training, for Girls. In other words, in much the same way that Dr. Howe has carried out his crusade against blindness, in the ordinary use of that term, he is now not only attempting to cure national blindness, but to point out how, as soon as the scales fall from our eyes, we will clearly see the benefits to be derived from training the whole body, individual and politic, for the exigencies of life.

A Purin-free Dietary. By Edna Alice Waite and Robert Ellsworth Peck, M.D. Published by Elm City Private Hospital, New Haven, Conn., 1916. Price 25 cents.

In these days when it is fashionable to attribute a very large number of symptoms to what is popularly known as gout, physicians are often at a loss to recall those foodstuffs which the physiological chemist has shown to contain an excess of purin bodies. This little paper book contains three parts: One, A Purin-free Diet List; Two, Sample Menus from which Purin-free Diets may be Made Up; and Three, A Series of Recipes with which the palate of the gouty can be pleased without insult to his metabolism.

International Clinics. A Quarterly. By Leading Members of the Medical Profession. Edited by H. R. M. Landis, M.D. Volume III, 1916. J. B. Lippincott Company, Philadelphia, 1916.

The departments considered in this issue of International Clinics are Treatment; including Gonorrhea, the Treatment of Obesity, and the Medical Uses of High-frequency Currents. This is followed by seven articles dealing with various aspects of Diagnosis; with one upon Pediatrics; two upon Dermatology; one upon Psychiatry; five dealing with Surgical Subjects; and, last of all, an Historical Contribution on Armand Trousseau.

Physiological Chemistry. A Text-book and Manual for Students. By Albert P. Mathews, Ph.D. Second Edition. Illustrated. William Wood & Co., New York, 1916. Price $4.25.

The speedy appearance of the second edition of Dr. Mathews's book, the first of which appeared just thirteen months ago, proves that our favorable comment upon it was justified and that it has met the needs not only of students but also of graduate workers in this department. It is interesting to note that the first edition was reprinted on two occasions to meet the demands of the market. The book is not materially changed, indeed, it could not be if the first edition represented as well as it did the physiological chemistry of 1915, but the author has taken the opportunity to correct mistakes, typographical and otherwise, which are unavoidable in the preparation of a first edition, has made directions as to tests and experiments more clear and practical, and has thereby brought the book thoroughly up to date.

It is a noteworthy fact that this book is not a mere series of tests and chemical formulæ, but deals with the functions of organs, and then with the products which they secrete or excrete. This is one of the reasons why it is valuable and interesting to the ordinary medical man as well as to the physiological chemist.

Diseases of Children. By Edwin E. Graham, A.B., M.D. Illustrated. Lea & Febiger, Philadelphia, 1916.

Dr. Graham, who is the Professor of Diseases of Children in the Jefferson Medical College of Philadelphia, has long been engaged in the teaching of this important department of medicine, and for a number of years has been bringing together facts which he has culled from his own experience and from literature for the preparation of this volume, which is quite a notable addition to pediatric literature, covering nine hundred pages. Like most books dealing with the diseases of children it is in some respects equivalent to a work upon the practice of medicine, with special reference to patients below the age of puberty. Naturally, the opening chapters deal with

The Normal Infant at Birth; with the Normal Development of the Child; with The Clinical Examination of Sick Children; and with the consideration of Infant Mortality and Heredity. Beginning with Chapter VI he discusses Congenital Malformations, and proceeds in Chapter VII to a consideration of Diseases of the New-born. After this there are chapters upon Infant Feeding; Normal Digestion; Fresh Air in the Treatment of Disease; Dentition; Disorders of Nutrition; and then, because of its importance, a long and exhaustive chapter of practically two hundred pages upon Diseases of the Gastrointestinal Tract. Fifty-three pages are devoted to Diseases of the Respiratory Tract; forty-seven to Diseases of the Heart and Blood. Then follow chapters upon the Ductless Glands, the Bones and Joints; the Organs of Speech; Diseases of the Skin; the Specific Infectious Diseases and Diseases of the Nervous System. The final chapter, XXVI, deals with Puberty. A very considerable number of original illustrations are found throughout the volume.

The book may be said to well represent our present knowledge in regard to diseases of children, and we have no doubt that it will prove a popular contribution to the subject to practitioners and students.

THE HOME CARE OF CONSUMPTIVES. By Roy L. French, M.A. Illustrated. G. P. Putnam's Sons, New York, 1916. Price $1.

The author of this book, a social worker and not a graduate in medicine, was at one time Secretary to the Kentucky Tuberculosis Commission. In carrying out the functions of his office he visited and studied many institutions, clinics, and open-air schools designed for the treatment of the tuberculous. His object in preparing the text of this small volume has been not to present medical men with facts with which they are unacquainted, but to discuss the subject more from the standpoint of the patient. There are thirty chapters, most of which are very brief. After discussing the subjects, What is Tuberculosis? The Relation of the Patient and the Physician, and Medicinal and Climatic Cures, he goes on to consider the Methods of Spreading the Infection, and then follows with chapters upon The Value of Fresh Air, Disinfection, Graduated Exercises, Marriage, Parenthood, and Tuberculosis; and in the twenty-eighth chapter answers, and answers well, the question, "Is the Fight Worth While?" Of course, the answer is in the affirmative. Fortunately, tuberculosis is a disease characterized by optimism on the part of the patient, and, therefore, most sufferers from this malady will agree that the fight is worth while, be the result what it may.

OBSTETRICS, NORMAL AND OPERATIVE. By George Peaslee Shears, B.S., M.D. Illustrated. J. B. Lippincott Company, Philadelphia and London, 1916.

The author believing that most obstetric works contain too much irrelevant matter, such as extensive discussion on developmental anomalies and fetal monstrosities, has omitted the traditional section on Embryology, the customary discussion of Anatomy, and even an extensive review of Physiology, and has gone straight to the matter in hand by dealing, first with Labor, Pregnancy, and the Puerperium; next with the Diagnosis of the Phenomena of Pregnancy, the Management of Pregnancy, the Antepartum Examination, the Fetus in Utero, the Physiology and Mechanism of Labor; the Diagnosis and Clinical Phenomena of Labor: its Management; Physiology and Clinical History of the Puerperium: its Management; and Multiple Pregnancy in Labor.

The second part of the book is devoted to the Pathology of Pregnancy and Labor; the third to Obstetric Surgery, including the General Technic of Obstetric Operations; The Procedures Designed to Overcome the Resistance of the Cervix; The Induction of Abortion and of Premature Labor; The Forceps; Version; The Cæsarian Section; Symphysiotomy and Pubiotomy and Embryotomy.

The fourth part is devoted to the Pathology of the Puerperium, and includes Puerperal Infection, Infection of the Breast

and Nipples, and other Complications of the Puerperium, such as Subinvolution; Uterine Displacements; Puerperal Psychosis; Postpartum Paralysis and Puerperal Myalgia.

Throughout, the work is characterized by a certain earnest insistence upon attention to those many details upon which the safety, indeed the life, of the mother so often depend.

The book is essentially practical. It is admirably illustrated, and in its 700 odd pages covers the subject extraordinarily well. The author is in the habit of summing up his chapters in a few sentences so clearly expressed as to make a permanent impression on the memory. Perhaps the key-note of the book is the minute attention to detail and the scrupulous consideration of the best interests of the mother.

DIAGNOSIS AND TREATMENT OF SURGICAL DISEASES OF THE SPINAL CORD AND ITS MEMBRANES. By Charles A. Elsberg, M.D., F.A.C.S. Illustrated. W. B. Saunders Company, Philadelphia and London, 1916.

This present volume is in the main a record of the author's personal experience in the surgical treatment of diseases and injuries of the spinal cord and its adnexa, and includes, as is proper, much that has been learned from others. It is confined rather strictly to a consideration of the diagnosis and treatment of diseases of the spinal cord that may require surgical interference, and necessarily includes a certain amount of neurology. Hematomyelia and spinal gliosis are considered because the author believes that in these diseases much harm is done to the fiber tracts by compression, and the relief of this compression by surgical means has resulted in marked improvement in a number of patients; moreover, that the time is at hand when selected cases will be regularly subjected to operative interference.

The first chapter is devoted to The Surgical Anatomy of the Vertebral Column and Spinal Cord. Thereafter follow chapters on Physiology, Localization, Symptomatology, and Methods of Examination. There is a section devoted to *X*-Ray in Spinal Disease; one on Operative Technic of the Various Surgical Procedures, with the Indications and the Various Contraindications therefor. Recent injuries are discussed; tumors receive very full consideration. Inflammatory Diseases are briefly covered, and the book closes with chapters on Complications of Pott's Disease, and on the Acute and Chronic Bone Infections and Dystrophies, including Typhoid and Railway Spine.

The book is issued in Saunders's best style, with admirable illustrations, and is characterized by a judgment and by a sense of proportion from the surgical standpoint most gratifying to the clinician who wishes to deal intelligently with this class of cases.

As a text-book for one who wants to prepare for an academic test it would be serviceable. As a guide in treating cases according to the latest concepts it is invaluable.

FIRST AID IN EMERGENCIES. By E. L. Eliason, A.B., M.D. J. B. Lippincott Company, Philadelphia and London, 1916.

This admirable book is offered the public, not as a technical and scientific treatise on the subjects handled, but as a help to humanity in general to meet and treat the emergencies which arise in every-day life. It is written for the laity, firemen, police, life-guards, boy scouts, explorers, factory workers, etc. It is so systematically arranged and clearly expressed that it should be largely helpful in public and private school education.

After a chapter on General Considerations, the general symptoms of common emergencies, and transportation of patients, there is a discussion of Surgical Principles and Supplies, including Application of Bandages.

Thereafter are taken up in turn Wounds, Hemorrhage, Heat and Cold Effects, Sprains, Dislocations and Fractures, Unconscious Conditions not Fits or Convulsions, Suffocation, Poisons, and Medical Emergencies.

The book is characterized by sound common sense and a sense of proportion.

CORRESPONDENCE.

LONDON LETTER.

BY J. CHARLTON BRISCOE, M.D.

This month there is again a complete dearth of medical news to record. The weather conditions, after setting in promisingly last month for harvest, fell off considerably, and continued unfavorable up till the middle of the present month, and as a result a fair quantity of corn still remains to be got up. One great advantage of the weather is that there has not been any epidemic of infantile diarrhea in London.

Popular interest has been aroused by the statement of Sir George Newman, who is the chief medical officer of the Board of Education, that there are at least a million children of school age who are so mentally or physically affected or disabled as to be unable to derive benefit from the education which the State provides, and a quarter of this million are seriously crippled, invalided, or disabled. The circumstances of the present time have naturally enhanced the interest in this problem, as it is of course most important for the nation to raise as many healthy children as possible to replace the men who are falling in this war. Compulsory education of an elementary character has been in force in this country for over forty years, but it is only in the last decade that a serious attempt has been made to cope with the diseases incident to early childhood under a system more or less of compulsion. At the present time there is no compulsion on the parent who has a child suffering from adenoids, defective vision, and so forth to have the child attended to, but the moral pressure exerted is fairly great, and the reiteration of the advice given seldom fails to produce an appropriate result.

Medical inspection of schoolchildren is now universal in this country, but as the children do not commence to attend school until five or six years of age, the important time of two to five years does not come under this scheme. The recognition of this fact has promptly led to investigations as regards unhealthy maternity and infancy, and to an examination into the conditions of home which are not desirable. In the past two or three years inquiries have been instituted into the causes of premature birth and of the early death of infants, and the results when published will probably show that the number of deaths attributable to congenital syphilis has been much overestimated in the past, but that conditions influencing the health of the mother are of considerably more importance than has hitherto been realized. This is bound to lead to a closer study of the home life and environment of the mother and child. The faults which are found to be prevalent are only to be remedied by educating the parents and by remedying the defects. Centers have already been established for giving advice to the parents, or to which they can bring their children exhibiting minor ailments, whilst in certain areas free meals are provided for the parents in a similar manner to those which have been for some considerable time instituted for feeding the children. Most of such schemes have been supported by those who are charitably disposed, the actual work having been done by a body of men and women whose services have not only not been paid for, but have been largely allowed to pass unrecognized. Such a state of affairs it is now recognized must be altered, and the State must itself take this important subject in hand and not leave such schemes to haphazard and charity. It must coördinate the whole system whatever the cost, in order that we may have a healthy set of children to continue the race and uphold the traditions which have grown up in this country.

The other night London was visited by hostile airships. Somewhere about midnight the sounds of gun-firing were audible, and on looking out of the window we were fortunate enough to get a good view of the Zeppelin, which was freely focused by the

search-lights and around which the shells were exploding. It was evidently some way off, appeared about a foot long, and was making in a northerly direction. While in view it was seen to make movements corresponding to the lower part of the figure of eight, and on completing the evolution continued its former direction until lost from view, owing to the intervention of the surrounding houses. The search-lights were suddenly turned off and the gun-fire ceased. We then got back to bed, but in about twenty minutes were again disturbed, and on this occasion the sound of propellers was very audible, apparently being almost above us, but no airship could be seen. The sounds were intermittent: evidently the engine was shut off from time to time. During a longer pause we got back to bed again, and there followed an interval of quiet succeeded by a number of dull explosions seven or eight in number, after which the sounds ceased and the rest of the night was undisturbed.

During the second period, that in which the sound of propellers was audible, but nothing was seen, there was suddenly a red glow in the sky, the origin of which was concealed by the houses, and which lasted apparently thirty seconds and then died away. This was in all probability produced by the Zeppelin catching fire and ending with its destruction. Those who were in the upper bedrooms and could see over the roofs of the houses, stated that they could see the origin of the blaze, which was a good distance from the earth, but unfortunately the houses intervened and I could only see the reflection in the sky. Such is a brief description of what happens in a place of safety, but the conditions are very different when the house happens to be in the direct line of flight of the Zeppelin, when, although a much clearer view is obtained, there is considerable risk from falling shrapnel and from the dropping of bombs. It is easy to distinguish the gun-fire from the dropping of bombs, as the explosion produced by the latter is a dull thudding noise, whereas the gun-fire produces a short, sharp report. As in former air raids, the greater loss of life is amongst those who went out into the streets to see what was happening, and stress is laid by the coroners and authorities in general on this fact. People are most urgently advised to remain indoors, but apparently the interest in watching the proceedings appears to outweigh the appreciation of the danger arising to those who leave their houses.

It is rather an uncanny sensation to hear people talking all around, and yet see nobody in the streets, also to hear the sounds of distant cheering following the destruction of the airship. The people who seem to take no notice of air raids are the cabmen and the street-sweepers. The cabmen continue driving, and at least one hansom cab passed up the street during the raid, though of course we were far removed from any source of danger from the Zeppelin seen. Similarly the street-sweeper does not discontinue his occupation. The local regulations in London are not nearly so strict as in some towns, where it is punishable to strike a match when the streets are darkened, and where on the notification of the approach of an air raider all the lights are turned out, the motor vehicles ordered to proceed at once to their depots, and the cyclists even with their lights shaded are not allowed to ride, but must proceed home on foot. It is stated that in the dark the lighting of a match can be seen for half a mile, so that these regulations are perhaps not unnecessary. In London, however, the motor cars and trams do not discontinue running and the lights are not turned out.

Although medical men are doing their best to keep up the practices of those who have joined the forces, it is only to be expected that those who are absent will suffer, and the receipts from their practices will fall off. However well intentioned the neighboring practitioners may be this is bound to happen, especially in this country where a man's work is so largely dependent on his personality. To those who are employed in the R. A. M. C. and consequently are away from their practices for a long

time, the rent of their private houses is a considerable item. The special act which was passed at the beginning of the war allowing leases to be broken, has come in very usefully to some of these practitioners. Only recently a doctor was able under this act to terminate a lease, with fourteen years to run, of the house in which he was practicing. He had found that during his absence the receipts from his practice had fallen off to such an extent that it was not at all worth his while to retain his house with a view to returning to his practice in the future. An offer was made, which proved quite satisfactory to the landlord, and no objection was made to the contract being cancelled.

The report issued on the health of London during the past year does not compare favorably with that of former years. There is an increase of deaths in the aged, which is attributed to influenza and respiratory diseases occurring during the winter months. As against this, however, it is to be recorded that the number of marriages in the London district are the highest ever registered. Taking the population of four and a half million, the marriage rate is 25.9 per mille, which is a record. A slight annual increase since the year 1908 has occurred, but the increase of 1915 is to be directly attributed to the war. Probably a certain number of marriages took place under the impression that married men were not likely to be called up so soon as the single, and this impression prevailed until late into the autumn of that year. The birth-rate, however, is not so satisfactory. In 1909 to 1913 it was 25, in 1914 it was 24.3, and in 1915 it was 23.6. The medical officer in his report attributed this reduction to the moral tone of the community, but against this it must be realized that the fall of the birth-rate is wide-spread throughout nearly the whole of Europe.

We regret to have to record the deaths of several eminent medical men. Sir Victor Horsley died in Mesopotamia from heat-stroke, while Sir James Goodhart and Sir Lauder Brunton both died at a good old age in this country, and both of them after illnesses of some little duration. Their reputation is such as to need no comment.

TINCTURE OF IODINE FOR RINGWORM.

To the Editors of the THERAPEUTIC GAZETTE.

SIRS: In the THERAPEUTIC GAZETTE published under date of August 15, 1916, and beginning on page 592, is an article entitled "Ringworm of the Hands and Feet." On page 593 the writer states: "The mechanical removal of the superficial layers of the skin is an important part of the treatment. This is well accomplished by soaking and then scrubbing with a moistened cake of pumice stone or coarse sand soap."

For the benefit of the readers of the THERAPEUTIC GAZETTE I wish to state that my experience in the treatment of ringworm has disproved the efficacy of the treatment as above quoted. In treating twenty-one cases of ringworm in the past twelve months—having for their location the scalp and feet, one case each; face, five cases; neck, four cases, one of which affected one ear; and ten cases affecting the hands and wrists—complete recovery was secured within from three to seven days by applying once daily the undiluted tincture iodine, U. S. P. (Eighth Revision), alcohol 93 per cent. In not one case was this treatment followed by a dermatitis. In every case the iodine was applied freely, after which the patient was admonished to see to it that no clothing came into contact with the painted surface; this to prevent irritation. There were no dressings applied. Several of the cases cited, affecting the hands, neck, and face, were multiple infections.

Very respectfully,

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GOTEBO, OKLAHOMA.